3/6
34185/b/2

THE

SYDENHAM SOCIETY

INSTITUTED

MDCCCXLIII

LONDON

MDCCCXLVI.

RESEARCHES

ON

PHTHISIS

ANATOMICAL PATHOLOGICAL AND THERAPEUTICAL

BY

P. C. A. LOUIS, M.D.

PHYSICIAN TO THE HÔTEL-DIEU; PERPETUAL PRESIDENT OF THE MEDICAL SOCIETY OF OBSERVATION; MEMBER OF THE ROYAL ACADEMY OF MEDICINE; HONORARY MEMBER OF THE MEDICAL SOCIETIES OF MASSACHUSETTS, AND OF EDINBURGH, OF THE PROVINCIAL MEDICAL AND SURGICAL ASSOCIATION OF ENGLAND; FELLOW OF THE COLLEGE OF PHYSICIANS AND OF THE MEDICAL SOCIETY OF PHILADELPHIA, OF THE ROYAL ACADEMY OF ST. PETERSBURGH, OF THE MEDICAL SOCIETIES OF HEIDELBERG AND BRUGES, OF THE MEDICAL SOCIETY OF OBSERVATION OF BOSTON.

SECOND EDITION CONSIDERABLY ENLARGED

TRANSLATED BY

WALTER HAYLE WALSHE M.D.

PROFESSOR OF PATHOLOGICAL ANATOMY IN UNIVERSITY COLLEGE, LONDON,
PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL,
AND TO THE HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST,
MEMBER OF THE MEDICAL SOCIETY OF OBSERVATION OF PARIS,
OF THE ROYAL MEDICAL SOCIETY OF COPENHAGEN, &c.

LONDON—MDCCCXLIV

REPRINTED 1846

349789

WELLCOME INSTITUTE LIBRARY

Coll.	WellMOmec
Coll. No.	

PRINTED BY C. AND J. ADLARD,
BARTHOLOMEW CLOSE.

TO

MONSIEUR CHOMEL,

PROFESSOR OF CLINICAL MEDICINE IN THE FACULTY OF MEDICINE OF PARIS;
HONORARY PHYSICIAN TO THE HOSPITALS OF PARIS;
MEMBER OF THE ROYAL ACADEMY OF MEDICINE;
CONSULTING PHYSICIAN TO THE KING OF THE FRENCH;
PHYSICIAN IN ORDINARY TO THE PRINCESS ROYAL;
MEMBER OF SEVERAL LEARNED SOCIETIES, FRENCH AND FOREIGN.

LOUIS.

TO MESSIEURS

A. BAZIN,

PROFESSOR IN THE FACULTY OF SCIENCES OF BORDEAUX;

GRISOLLE,

PHYSICIAN TO THE BUREAU CENTRAL OF THE HOSPITALS OF PARIS;

B. FR. CARL HECKER,

OF BERLIN;

MARSHALL HALL,

OF LONDON;

LEURET,

PHYSICIAN TO THE LUNATIC ASYLUM OF BICÊTRE;

VALLEIX,

PHYSICIAN TO THE BUREAU CENTRAL OF THE HOSPITALS OF PARIS;

WOILLEZ,

PHYSICIAN TO THE LUNATIC ASYLUM AT CLERMONT.

You have afforded me a strong mark of your esteem in dedicating your best Works to me; permit me, by placing your names at the head of this Volume, to testify at once my gratitude and my profound admiration of works which will ever form models difficult of imitation.

LOUIS.

NOTE BY THE TRANSLATOR.

I AM unwilling to send forth this version of M. Louis' treatise, without a few words of introduction, although circumstances deprive me of the ordinary topics of a translator's preface. I am neither called upon to introduce my author, nor to laud his work. The one is known wherever medical science is cultivated; the other almost as universally admitted to contain the most profound exposition of the natural history of chronic disease, of which the literature of any age or country can boast. Nor am I required under the actual tendencies of medical science, to plead the cause of the principles of minute observation and numerical analysis, by which the results recorded in this volume were so scrupulously obtained. Those principles are, in point of fact, demonstrably the means whereby all indisputable inferences and solid doctrines have of late years been established in the science of pathology; and that observation and that analysis are likewise recognized by pathologists, as the instruments by which, through all time, truth must continue to be sought. At least they are so recognized by all pathologists, who—having first freed themselves from the trammels of prejudice, and the delusive influences of dogma, and imbued

their minds with the elevating creed of man's unlimited powers of labour—have thought deeply upon the reasonable aims of their science, and the conditions under which those aims promise to become realized.

It would in all probability be impossible for any observer to have continued for a length of time in the constant habit of watching patients affected with any given disease, and commonly of committing minute particulars of their cases to writing, without drawing some inferences, peculiar to himself, respecting the phenomena of that disease. I have been for years thus engaged with the study of the affection described in the following pages. But I have resisted my first impulse to add the chief results of the experience thus acquired, in the form of annotations or commentary; regarding this negative course as being, at once, more courteous to the illustrious person whose work I have translated,—and, likewise, perhaps more strictly in harmony with the plans, as I understand them to have been avowed, of the Sydenham Society.

Certain readers will probably object to some of the terms used in the following pages, as strongly savouring of a French origin. I have endeavoured to leave the translation, generally speaking, as little open to this objection as possible; but in some of the instances in which it may be urged, the obnoxious words have been not unadvisedly employed. There are certain conditions to which the pathologists of France have paid more attention than those of Great Britain; to signify these conditions—generally composite ones—they use terms which have no precisely vernacular counterparts in our tongue, simply because the ideas they represent have not been for any considerable time current

among us. A translator from the French finds himself, consequently, obliged either to have recourse to versions, somewhat foreign in character, of those terms, or to express their signification by periphrasis. I have adopted the former alternative, though I am aware I may have thereby exposed myself to the criticism of advocates of the "pure Saxon"—a class with which it has of late years become much the fashion to seek identification.

I am desirous of expressing my acknowledgments to the Council of the Sydenham Society for intrusting to me the preparation of this work for its members. Connected, as I have been, for many years, with M. Louis, first as his pupil, and subsequently by the ties of the friendship with which he has honoured me, I cannot do otherwise than feel deep gratification at finding myself instrumental—however humbly—in disseminating doctrines to which I am attached, as well from personal interest in their author, as from the inmost conviction of their dignity and truth.

W. H. W.

London, March 1844.

AUTHOR'S

ADVERTISEMENT TO THE SECOND EDITION.

The publication of the first edition of this work so shortly after the appearance of those of Bayle and Laennec on the same subject, might have been viewed as a rash proceeding, so completely did that subject seem exhausted. Nevertheless, my Researches were favorably received by the profession, and the study of phthisis has engaged the attention of most judicious persons, and made steady progress, since 1825. I have consequently been enabled, in the present edition, to profit by some remarkable inquiries on the same subject, without, nevertheless, altering the character of the work, in which my chief object has been to make known the results of my researches upon phthisis in persons who have passed the age of fifteen.[1]

[1] Microscopical inquiries confirm the results of clinical observations as to the non-inflammatory character of tubercle, and I hasten to lay before my readers the following communication which I have just received from Dr. Lebert (of the Canton of Vaud).

"Tubercles," he says, "present microscopical elements proper to themselves, and distinguishing them from all other morbid products; in this respect they obey the general law, that all existences which are really different pathologically, differ also in respect of molecular composition.

"Tubercles contain a great quantity of molecular globules, varying in diameter from $\frac{1}{16000}$ to $\frac{1}{8000}$ of a line [$\frac{1}{8000}$ to $\frac{1}{4000}$ of a millimeter], a hyaline substance which unites their elements, and a species of corpuscle which gives them a peculiar character. These corpuscles are of irregular, angular form, vary in diameter from $\frac{1}{2000}$ to $\frac{1}{3000}$ of a line [$\frac{1}{100}$ to $\frac{1}{150}$ of a millimeter] and, generally speaking, present a well defined edge. Their interior is yellowish coloured, slightly opaline, and often contains molecular granules, distributed through its substance; they never contain true nuclei, which are so common in cancerous globules, and so constant in those of pus. Acetic acid, which

As certain writers considered themselves justified in questioning the accuracy of some of the general facts recorded in the first edition of these Researches, I have felt it my duty to inquire if I had in reality drawn premature conclusions. I with this view acted precisely as if, in the first instance, I had not taken all necessary precaution against the occurrence of error, and immediately applied myself to fresh investigations. These investigations, conducted since 1825, have corroborated the first, and led to the same conclusions; and similar results have been obtained by other persons, whose accuracy, as observers, leaves nothing to be desired. It consequently appears to me impossible, at the present day, to doubt the reality of the laws deduced from

renders the latter transparent, and displays nuclei within them in a very distinct manner, renders the tuberculous corpuscle also more transparent, without disclosing true nuclei in it. If enough water be added to the tuberculous corpuscles to make them float, their form is discovered to approach that of an irregularly polyhedral sphere, instead of being flattened, like the globules of pus or cancer. They are so numerous, generally speaking, and present so many superimposed layers in the best microscopical preparations, that it is necessary to have observed them repeatedly, and with a clearly defining magnifying power of from four to five hundred diameters, in order to acquire an accurate notion of their characters, and enable the observer to detect them in all tubercles.

"*Pus* has often been set down as a sort of first stage of tubercle, and has even in the concrete state been confounded with tubercle. But the two products differ essentially.

"*Pus* is formed of serum and globules, which gravitate by rest, and average $\frac{1}{160}$ of a line [$\frac{1}{350}$ of a millimeter] in diameter. Their outline is tolerably well defined without being regularly rounded, although much more nearly approaching the spherical form than the tuberculous corpuscle; it has a wrinkled look, and presents superficial indentations. They are of a clear yellow colour, somewhat flattened, and rather of disc-like than spherical form. Their surface, which is in some sort transparent, presents some molecular granulations which extend into their interior. This interior is composed of a gelatinous homogeneous fluid, and of several nuclei, which, when viewed through the involucrum, look like nebulous spots; they are not always clearly seen without the assistance of acetic acid, which renders the involucrum very transparent. They vary in number from two to five; their diameter ranges between $\frac{1}{300}$ and $\frac{1}{160}$ of a line [$\frac{1}{420}$ and $\frac{1}{350}$ of a millimeter]; they are oval or round, their outline distinctly defined, and they lie on the same plane. The globules are identical in recent pus, no matter where it has been formed. The chemical varieties of the fluid depend upon the serum which holds the globules in suspension; if these be of bad character, it may produce alteration of shape in, and partially dissolve them. When pus is concrete, the serum has partly disappeared; but sometimes a great number of unchanged globules are still to be recognized, whereas generally they have undergone alteration, and then present numerous molecular granules, quantities of nuclei, and a great abundance of

the facts observed by me before 1825, or to hesitate regarding them as demonstrated general truths.

The only alterations made in the present edition refer to the order in which some of the symptoms are considered. But I have made considerable additions of two different kinds: some to corroborate the general statements made in the former edition; others relative to points which had either not been considered at all or too briefly examined.

I have made the additions of the first kind, because I did not conceive it right to confine myself to the simple statement that I had verified such and such a general fact by additional observations. Whenever I have been able to do this, I have stated the number of new cases collected, and the conclusions naturally

viscid grumous particles of small size collected in pairs. The elements of concrete pus never resemble those of tubercle.

"Tubercle does not differ less from *cancer* than from pus, even in cases where the naked eye can only discover points of resemblance between them. The main elements of cancer are fibres and globules. The latter, varying in different species of cancer, are larger than tuberculous corpuscles, have non-angular outlines, almost all contain nuclei, and frequently present a true system of encasement within each other. Their diameter varies from $\frac{1}{180}$ to $\frac{1}{50}$ of a line [$\frac{1}{25}$ to $\frac{1}{45}$ of a millimeter], and in some cases is still greater than this. Tuberculous corpuscles never attain to the minimum even of these dimensions.—*Scirrhus* presents a fibrous, dense, irregular or retiform stroma, containing within its meshes round or slightly oval globules, reaching a diameter of $\frac{1}{150}$ of a line [$\frac{1}{50}$ of a millimeter] and generally containing a round, oval, or irregularly-shaped nucleus. They are flattened, but slightly spherical, and many of the nuclei are free and without involucrum. The globules sometimes elongate, become fusiform, and present a shape holding a middle place between globules and fibres.—The globules of *alveolar cancer* differ still more from tuberculous corpuscles. Their diameter varies between $\frac{1}{120}$ and $\frac{1}{160}$ of a line [$\frac{1}{60}$ and $\frac{1}{25}$ of a millimeter]; they contain a nucleus of from $\frac{1}{320}$ to $\frac{1}{240}$ of a line [$\frac{1}{160}$ to $\frac{1}{120}$ of a millimeter] in diameter, in the interior of which are granules. They are flattened and minutely dotted over the surface. In this species of cancer are also found globules reaching $\frac{1}{12}$ of a line [$\frac{1}{18}$ of a millimeter] in diameter, composed of globules, encased concentrically within each other.—The globules of *encephaloid* cancer exhibit no less marked differences; their diameter varies from $\frac{3}{500}$ to $\frac{7}{500}$ of a line [$\frac{3}{400}$ to $\frac{7}{400}$ of a millimeter]; they contain one or two, rarely three, little nuclei, varying from $\frac{1}{800}$ to $\frac{2}{800}$ of a line [$\frac{1}{320}$ to $\frac{2}{320}$ of a millimeter], generally placed at the periphery, and of round or oval shape; their colour is pale, their surface homogeneous. The outlines of the nuclei are clearly defined. Some globules are provided with an involucrum, and appear to be contained within a larger globule, the diameter of which then reaches $\frac{1}{100}$ of a line [$\frac{1}{50}$ of a millimeter]."

Thus, says Dr. Lebert, tubercles contain elements which are discovered in no other morbid product; and whenever examination with the naked eye leaves a doubt as to the tuberculous, purulent, or cancerous nature of any given substance, the microscope will easily settle the point.

flowing from them. My motive for not throwing the two series of cases into one is, that two groups of cases, collected at different periods, and both of them supplying their own general inferences, appear to me to depose more strongly to the truth of these inferences than a single series, although composed of a very considerable number of facts and furnishing the same conclusions. Those who are not so thoroughly persuaded as I am of the difficulty attending the establishment of general facts, will probably be of opinion that I might have dispensed with these additions; but others will hold a different view, and the most captious and difficult to satisfy are those whom I felt it my duty to aim at convincing.

The additional numerical results, corroborating the former ones, refer chiefly to the anatomy of the disease,—the most important of them to the air-passages, the intestinal canal, the pleura, the lymphatic glands, and the peritoneum. There is no organ to the description of which I have not made some useful addition.

The additions of the second kind are considerable in amount. The most important among them have reference to the course of the disease, to its acute form in particular; and to the subjects of the diagnosis, etiology, and treatment of the affection. Chronic peritonitis, which I have frequently, since 1825, pointed out in my Clinical Lectures, and elsewhere, as an affection peculiar to phthisical subjects, is made the matter of an entirely new section. The same is the case with Meningitis and Prognosis; in such manner that my first Researches are more than doubled in extent.

I have retained the remarks appended to the cases in the first edition, not omitting even those relating to the Physiological Doctrine; because that doctrine, though now, practically speaking, buried in oblivion, is yet sufficiently attractive, both from its simplicity and the manner in which it was taught by its illustrious author, to justify guarding against the possibility of its resuscitation.

In proportion as phthisis is better understood, its ubiquity more fully established, and the alterations of structure which are capable of shortening its duration, and accelerating the period of death, better ascertained,—in a word, in proportion as our knowledge of the affection becomes more perfect, the mind feels relieved, the horizon widens, and the attention of medical observers naturally commences to direct itself to the investigation of the

higher questions of etiology and treatment of that affection which is, in truth, the most terrible in the nosology, destroys the greatest number of victims, and may, without exaggeration, be termed the most relentless enemy of the human race.

Unless I am greatly mistaken, the associated efforts of a great number of medical men placed in different circumstances are absolutely requisite for the establishment of any grand and really useful result in respect of the causes and treatment of phthisis. Some of these medical men should be attached to large public institutions, others hold no such appointments; the medical staffs of the army and navy should furnish their contingents,—in a word, nothing less than an actual crusade would suffice. And this expression cannot be taxed with exaggeration; for, in truth, as I said a moment since, the object is to ascertain the means of successfully combating the most ruthless enemy of the human race.

The mode in which these united efforts ought to be directed is the next point for consideration.

It is obvious that in the first place all medical men, desirous of taking a share in the solution of the great problems referred to, should be as perfectly acquainted as possible with the course and symptoms of phthisis. Too much stress cannot be laid upon this point. For the truth is, that the dissentient opinions held by medical observers on the causes and terminations of phthisis, as also upon the therapeutical agents which possess or do not possess any power over the disease, arise almost solely out of errors of diagnosis. They originate in the fact of various other affections being mistaken for phthisis, or complicated cases being taken for simple ones, as will be seen in the first chapter of the part devoted to the subject of Treatment. And if, as a multitude of circumstances go to show, tuberculous disease not unfrequently stops short in its course, soon after its invasion, without having given rise to very serious symptoms, or extensive local anatomical change, it is plain that accurate acquaintance with the signs of the disease, and perfect familiarity with the different methods of examination of the chest (as auscultation and percussion) are absolutely essential on the part of persons intending to engage in the inquiries under consideration. Otherwise, many cases of phthisis, and these the most important to be recognized, would altogether escape detection.

The first condition then, for the successful undertaking of any inquiry into the causes and treatment of phthisis, is precise knowledge of the disease and of all affections which might be mistaken for it.

This preliminary condition once fulfilled, it would be necessary that such medical men as feel themselves possessed of the necessary energy, and comprehend the noble and elevated aims necessarily bound up with the exercise of their profession, should determine to take notes of the cases of *all* their private patients, and more especially of those who present any of the general or local symptoms of phthisis. The latter class of patients they should examine with extreme attention, ascertain their place of birth, and the various places they have subsequently inhabited, inquire into their mode of education and habits of life at all periods of their existence, as also the diseases under which they may at any time have suffered,—note down their temperament, the strength or weakness of their constitution, the slow or rapid course of their disease, &c. &c. Did the patient in any particular instance belong to the working-classes, it would be matter of extreme importance to ascertain at what age he commenced his apprenticeship, and what changes, if any, had occurred in his health from that period; further, whether he had uninterruptedly applied to his trade, or enjoyed intervals of rest from time to time. It cannot, in fact, be matter of indifference, in connexion with the influence of any trade upon the development of such or such an affection, that the pursuit of that trade should have been commenced or not at any early age,—or followed without interruption, or the contrary. It is also a matter of extreme importance that the sort of lodging inhabited by patients, and their ordinary diet, (especially when they belong to the working-classes) should be very carefully noted. The health of the father and mother, and other members of the family, if possible, should also be inquired into with similar care,—in consequence of the apparent reality of hereditary influence on the development of organic diseases, more especially of phthisis, &c. &c. And if it appeared to result from these inquiries that phthisis—a greater or less number of the symptoms of which affection are supposed to be present—had stopped short in its course, the observer should examine with additional closeness and care into the circum-

stances which accompanied the disease in its course, and more especially at the period when its suspension appeared to have taken place. And this for the simple but all-important reason that, should we succeed in ascertaining with any degree of precision what these circumstances are, and should it fall within the power of the physician to produce them at will, the curative treatment of phthisis would be discovered.

An investigation, similar to that of which I have now pointed out the chief particulars in regard of patients treated at their own homes, either in the country or in town, should be conducted also in the various public establishments, more especially the hospitals. In these establishments it would be necessary in each case, after having carefully studied the existing affection, to inquire into the previous health of the patient, for the purpose of ascertaining, in cases where no actual symptoms of tuberculous disease are present, whether such symptoms might not have existed at some anterior period. In the course of time we might thus ascertain, by comparing the symptoms with the organic changes discovered, that some anatomical states, at present regarded as among the sequences of tuberculous development, really own such origin.

The medical officers of the army should in the same manner investigate the state of health of the soldiery, inasmuch as they live under different hygienic conditions from civilians, and must necessarily supply additional data for the solution of the problems under consideration. Every soldier should be carefully examined, when admitted into a regiment, his chest minutely explored, and his medical history made out with the very fullest detail and accuracy, so as to enable the observer to decide with perfect confidence whether, in case of his subsequently falling ill, and presenting pectoral symptoms, these symptoms depended upon some affection of old standing, or were the effects of some perfectly new morbid state.

The sea-forces should be submitted to the same kind of examination, from the sailor to the superior officer, who cannot have reached his elevated position without having passed the greater part of his life at sea, amid tempests and dangers of every description. Here, again, must arise new data for our inquiry. The seaman and the landsman do not breathe the same air,—they feed upon different kinds of diet, and are

generally born and brought up in very different countries. The comparative pathology of the two classes, even limited to the point of view in question, must prove replete with interest.

Now, if this system of investigation—of which I have only given a very imperfect outline—were undertaken and continued for a sufficient number of years, by a sufficient number of persons, the proportion of cases of phthisis, which undergo spontaneous cure, or stop short in their course, would soon be ascertained. The age, the sex, the temperament, the constitution, the trade, or profession, &c. &c., which are most favorable, or the contrary, to such termination would be made out; and possibly, also the conditions discovered, capable of promoting the cure, or at least warding off the fatal issue, of the disease.

No doubt the task I propose is a difficult one, and would require much unity of action, and a strong and determined will on the part of those engaging in it; I am far from deceiving myself on this head. But, not to speak of the eminent distinction which must attach to the actors in such an enterprise when brought to a successful conclusion, is it not absolutely called for,—and am I not justified in affirming that henceforth the study of phthisis, of its causes, and of its treatment, cannot make any serious progress without the aid of joint efforts, undertaken on a grand scale? And of whom can the profession expect those efforts, to whom can they look for the improvement of their art, or for the discovery of the laws which should guide them in its exercise, but to themselves, and themselves alone? The medical profession has not, like the legal, governments to make bad or good laws for their direction; their laws, themselves must search out from the midst of elements infinitely varied,—from the midst of a sort of chaos, into which time and toil can alone introduce any order.

The labours I have sketched out, however, would be incomplete, and elements of great importance for the solution of our problems would be deficient, unless we obtained a knowledge of the characters of phthisis in foreign countries, under the most varied latitudes, and under the influence of habits more or less different from our own. It was for this reason that I last year ventured to propose to the Royal Academy of Medicine[1],

[1] See the Bulletin de l'Académie Royale de Médecine, t. i, p. 312; t. vii, pp. 628, 649.

that they should institute a society, which we are without, and respecting the utility of which the most judicious persons are agreed. I allude to travelling physicians, whose mission should be, not to attempt the thorough investigation of all diseases, but to study especially the causes, the course, and the treatment of severe maladies, more particularly of those commonly terminating fatally—diseases among which phthisis, on account of its extreme frequency, and its serious character in every point of view, should be the earliest investigated. The travelling physician, however—whom I suppose endowed with strong sense, solid knowledge, and intrepidity of character, for all three are equally indispensable—could not collect all the facts necessary for the attainment of the object in view, when chronic diseases were those under study. But under these circumstances he should communicate with some of the medical men of the town or country he visits, so as to be enabled to complete the observations he has commenced, and increase their number. This would be the less difficult in large towns, as he would always meet with some medical man who had, for a time at least, attended one of the universities of France.

My conviction, I repeat, is—and it is a conviction shared by many[1]—that the study of the causes and treatment of phthisis cannot henceforth make solid progress but by association. And it is to be hoped a mistaken spirit of egotism will not throw obstacles in the way, nor the members of the profession fear, that by collecting materials to be employed by others, they should aid in increasing the reputation of certain of their brethren, and not their own. Each individual would, in truth, have his share of distinction from the monument of industry and research to be raised; for all who had supplied materials for its elevation must be necessarily named, and the number of facts furnished by each recorded.

I shall not say more upon this subject, nor inquire here how the association should be organized. I believe, however, that its organization would not, with the assistance of government, present extreme difficulty. I shall terminate these remarks

[1] Journal des Débats; feuilleton de l'Académie des Sciences, Fevrier 1843, par M. Donné.

with a few observations upon the method followed in pursuing these researches recorded in this volume.

After having grouped my cases in respect of their outward analogies, I inquired how many times any given morbid change or symptom existed in each group. In a word, I counted the number of instances in which those symptoms or anatomical changes had occurred, in order to determine their true value; for symptoms or anatomical changes which present themselves invariably in a given disease, are of vast importance, and become more and more insignificant in proportion as they occur less frequently. I was led to the adoption of this method, designated as that of numerical analysis, not by choice, but naturally, involuntarily, and necessarily, solely because I *seriously believed* what it has long been the fashion to repeat concerning medical science,—namely, that it is a science of observation, and of observation purely. I was led to adopt it in order to ascertain the signification of the facts I had observed; such is in truth the sole motive for counting the symptoms or anatomical changes occurring in cases grouped according to their apparent analogies.

Some physicians have, it is true, criticised this method most stringently; but the force of evidence has made converts among those at one time most vehemently opposed to its adoption. Thus M. Trousseau (after having spoken in terms much too flattering towards myself, to allow of my repeating them here, of the share which he ascribes to me in producing the existing state of medical study) remarks—"I was one of the most violent and unjust detractors of this method; *I did not understand it.* Now that I have studied it I feel that it alone is capable of ensuring the solid advancement of our science, that it alone can enable the observers of one age to avail themselves to useful purpose of the labours of preceding ones, and slowly raise a structure which the reveries of a Galen or a Paracelsus must fail to overturn."[1]

This is no doubt a high eulogium of the numerical method, but it is by no means an exaggerated one. How, in truth, can the experience of successive generations be made available, how can result be added to result, unless by counting facts collected

[1] Journal des Connaissances Médico-Chirurgicales. Juin 1835, p. 363.

into groups determined by their analogies?[1] Suppose, in truth, that the series of cases spoken of just now, and which appear to me requisite for the determination of the causes and appropriate treatment of phthisis, were within our reach, how could we use them, how arrive at the knowledge of the general facts, whereof it must contain the elements, without the aid of the numerical method? Without the aid of this method, in truth, we can have none but isolated facts, and neither general laws, nor science; or if, on the other hand, the attempt be made without it, to establish general propositions, that attempt can only, as M. Trousseau says, lead to fantastic reveries.

Paris, 1843.

[1] See Dr. Danvin's Thesis (*De la Méthode Numérique et de ses avantages dans l'étude de la Médecine*, Paris, 1831); the report of the discussion which took place at the Royal Academy of Medicine (*Bulletin de l'Acad. Roy. de Médecine*, Paris, 1836, t. i, p. 622 et seq.); and my Mémoire sur la recherche des faits généraux (*Mémoires de la Société Médicale d'Observation*, t. i); for a full exposition of the principles of this method. I would especially invite to a perusal of these essays, medical men who, like M. Combes (*De la Médecine en France et en Italie*, Paris, 1842, p. 384), state that numerical analysis confines itself to counting facts *without interpreting them;* or who, like M. Plesson (*Journal des Découvertes*, livr. i, p. 10), assure their readers that the statistical or numerical method registers facts as they are observed, without any reference to the circumstances under which they originated, &c. The time has really come when persons desirous of speaking of the system of numerical analysis, should take the trouble of studying it in the works of those who employ it, and who have shown the difficulties of applying it in such manner as to arrive, without apprehension of incurring error, at the knowledge of general facts.

ADVERTISEMENT TO THE FIRST EDITION.

The appearance of additional researches on Phthisis, so shortly after the publication of those of Bayle and Laennec, will probably be matter of general surprise. Those observers have, in truth, described the principal symptoms and the anatomical character of the disease with such accuracy, that they appear to have left nothing to be done by their successors, and that it would be, to say the least, useless to rehandle a subject so ably treated, could it be considered under no novel aspect. My object has consequently been to treat it in a different manner.

Shortly after I had commenced the steady pursuit of clinical observation, I remarked, that during the course of phthisis as of other chronic diseases, (and even more so than in these,) the greater number of the functions undergo disturbance to a remarkable amount, and that the various organs performing those functions, become the seat of certain structural changes. I saw, too, that considered in this manner, the history of phthisis was exceedingly incomplete, in truth had been scarcely attempted, and I proposed to supply the deficiency. Numerous facts satisfied me at an early period that the course of the disease might likewise be illustrated usefully by new cases, and in this discovery lay an additional motive for undertaking the task of which I now produce the results.

In order to render my inquiries as useful as possible, I examined my phthisical patients with as much care as I should have done, had the affection under which they suffered been very imperfectly understood. I inquired into the state of all their functions, ascertained, as far as possible, the nature of any maladies they might have laboured under before they fell under my observation, and after their death I investigated the condition of all their viscera with equal attention. This method of procedure was

obviously a tedious one, but it was easily worked upon and certain in its character. It is manifest that the results to which it led must of necessity be accurate, and the consciousness of this lightened the labour inseparable from its employment.

Thoroughly persuaded of the importance of facts of the negative class, and remembering the embarrassment and regret expressed by Morgagni, on finding the cases of Valsalva deficient in the mention of certain facts of that kind, I recorded those observed by myself with as much care as positive facts of the most interesting character. I even set down indiscriminately all the statements made by patients respecting any previous ailments they had experienced, provided the character of their narrative attested its accuracy, leaving to another period and to the post-mortem examination the task of determining the facts to be retained or suppressed.

We may easily form a just conception of the importance of negative facts, if we reflect that in a considerable number of instances, organs, which have undergone very advanced structural change, do not give rise to any appreciable symptoms, and that, if this deficiency of symptoms have not been expressly noted during life, we are without any guide for the formation of our judgment regarding the post-mortem appearances. Hence the absolute necessity of inquiry into the condition of all the functions, those which are disturbed and those which give no evidence of derangement. A different plan might very readily enable us to verify what has been said by others, but never lead us to the discovery of additional facts.

In order to remove all doubt as to the correctness of my reported cases, I have always noted the condition of the intellectual faculties in my patients. I made up my mind, in all questions of their commemorative history, to make use of such cases only as referred to patients endowed with a certain share of understanding, and more especially of memory.

I was exceedingly careful in my manner of interrogating patients, conscious that certain modes of putting questions actually dictate the answers. Thus, for instance, when I was desirous of ascertaining whether a patient had experienced pain or uneasiness in one side of the chest, I first spoke to him of the side which I supposed free from pain; if he then pointed to the other side as the seat of suffering, I esteemed the fact as

certain, and took note of it accordingly. In order to ascertain dates, especially when referring to periods long passed and important to be determined, I reiterated my questions repeatedly, inquiring on each occasion, not if the patient had experienced such and such a symptom for such and such a length of time, but how long he had experienced it. It is clear that to the first question the patient, if annoyed or fatigued by the interrogatory, might answer yes or no, as a matter of chance; whereas, a reply to the second involves the necessity of some reflection on his part,—nor can the patient so readily lead the observer into error by a chance answer.

I have described, with all the accuracy in my power, the situation, form, colour, consistence, and thickness of organs, as discovered after death,—in a word, all the changes they presented. In making my observations I never, except in the instance of the brain, examined the viscera *in situ*. Lying in their natural position the various organs are imperfectly seen; the thickness and consistence of thin membranous organs, composed of several tissues, such as the stomach or intestines, cannot be accurately ascertained; it is difficult to examine them throughout, and many changes of structure, for instance, small ulcerations, almost inevitably escape discovery. In such cases it is necessary not only to remove the organs, but to free them by repeated washing of the various matters in contact with them, sometimes even to steep them in water for an hour or two. All this I have almost invariably done.

The history of softening of the brain suffices to prove the importance of examining the various degrees of softness or firmness of organs. It is well known that part of the brain may be softened and almost reduced to the liquid state without undergoing very obvious change of colour; so that to limit our examination of the viscus to the latter condition would be in truth to do nothing. The same may be said of the mucous membranes, which are sometimes found as soft as mucus, without any accompanying change of their natural whiteness.

The conviction of the importance of these principles led me to relinquish, in respect of certain points, the cases I had collected at the close of 1821 and the beginning of 1822. At that time I in truth frequently omitted to note the various degrees of consistence of the mucous membranes; I had not yet fixed

my attention upon certain of the morbid states of the stomach; and had I employed such cases, I should inevitably have fallen into error and recorded inaccurate results. Again, whenever any case appeared to be imperfect, or deficient in the amount of accuracy which I deem essential, in respect of any given point, I set it aside and made no use of it; this explains the fact, that my numerical results are not always derived from the same number of cases.

Thickening of the tissues is another of the conditions which it is most important to observe; it is in fact occasionally the only appreciable alteration of organs,—witness hypertrophy of the heart in certain cases, and the thickening of the sub-mucous tunic of the large intestine, of which I shall have occasion to speak in the course of this volume. Considered *separately and alone,* redness is a condition of much less interest, although many medical men, and among them persons of the greatest ability, confine themselves, in describing membranous organs, to a statement of their colour. Redness may depend on various causes, inflammation or simple congestion, and may be produced during the last moments of life only. The proof of this latter fact is afforded in certain cases of sudden death, occurring in individuals who, a few minutes before life ceased, presented all the attributes of health, and in whom the gastro-intestinal mucous membrane, for example, is found more or less red. But under these circumstances, it is neither thickened, nor softened; whereas redness, thickening, and softening generally coexist in cases where the symptoms of inflammation of this membrane have been strongly marked. From this it follows that red discoloration has no pathological signification, unless when coupled with change in the consistence and thickness of tissues, and that in cases where these latter properties have undergone no alteration, the cause of the redness cannot be divined but with the aid of the symptoms. I may add, in order to place the importance of the alterations in question in a stronger light, that redness may disappear after death, whereas thickening and softening of tissues undergo no such variation.

The cases on which these researches are grounded were collected at the Hospital of La Charité, from the month of October, 1821. From that time I collected the cases of all the patients admitted into M. Chomel's wards, which contain forty-

eight beds equally divided between both sexes. All these cases were taken on the same principles and with the same details; and as it appeared to me impossible to carry on a system of observation such as this, and attend to private practice at one and the same time, I relinquished the latter altogether for the time being. I regularly passed three or four, and sometimes five hours daily at the hospital, devoting at least two hours to each post-mortem examination. And although habit must have familiarized me with anatomical investigation, I still employ the same time that I did two years ago in the examination. For I am convinced that if we wish to observe well, we must not observe hastily; and that the sole means of rectifying unavoidable errors is repeatedly to submit to new examination questions which we may have at one time believed settled, and consequently to go on perpetually observing the same objects, just as if they were, in each instance, beheld for the first time.

I have satisfied myself, by comparing my lately collected cases with those collected formerly, of the advantage of not undertaking observation (at least when undertaken with a view to publication) until we have passed very early youth. I mean until we have attained an age, when we can estimate things at their real value, and when experience has put us on our guard against every description of illusion and theory, and taught us that the first, the essential, desideratum is truth. I was as deeply devoted to study formerly as I am now, but I was not proof against the attractions of a theory cleverly put together; I cared less for accuracy, and sacrificed less time in satisfying myself of the correctness of supposed facts. These mental tendencies, clashing as they do with the pursuit of sound observation, depended both upon youth and deficiency of experience. Few persons are free from them; and I am of opinion that for this reason we ought, generally speaking, to place less reliance on cases collected by very young men, and *above all not intrust the task of accumulating facts to them exclusively.* For, besides the objection on the score of age, it is certain that we cannot observe for others with the same zeal, assiduity, and accuracy that we should for ourselves. And again, if we look to other sciences, do we find those who advance them labouring by proxy? Does the natural philosopher concede to another the task of performing his experiments? Does the chemist confide his analyses to the care

of a novice? And if, as is absolutely the fact, there be perfect analogy between the physician who observes, the natural philosopher who experiments, and the chemist who analyses, why should they follow different courses? The admission that individual cases are wanting in medical science, is not enough,—the conviction that zeal, time, and practice are required for the collection of good ones, is also essentially requisite. Practice is, I repeat, necessary; for the collection of cases is a *trade*, which, like others, can only be learned, and never divined.

I shall perhaps be pardoned by the reader for thus dwelling upon the care bestowed upon the collection of my cases, and upon the distrust with which some of those daily published should be received, if he reflect that medicine depends for its very existence, as a science, upon *facts*, and that truth can flow only from those that have been well and fully observed. Then and only then may a series of cases be regarded as data for the solution of a problem, in which the object is to ascertain the value of several unknown quantities. And, as in mathematics, that value continues one and unchanged, no matter who be the worker of the problem, so in medicine, the analysis of the same facts must lead to identical results,—only where a person of ordinary capacity will discover but a small number of general facts, another endowed with intellect of higher order will detect a great number, simply from having viewed and examined the same facts under more various aspects. But accurate facts, so long as they are examined under the same points of view, must lead to identical results, no matter who be their analyser. There is something better than obscurity and uncertainty in medicine, when accurate facts are made the subjects of study: but from the consideration of doubtful, imperfect, or erroneous facts, what description of deduction could be expected?

The method to be pursued in the solution of the problem is neither of arbitrary nor uncertain character; it consists almost solely in collecting the various symptoms indicative of disturbance of any given function, and if death ensue, confronting these with the state of the organ performing that function. If this be more or less seriously altered in structure, and if this alteration by reason of its nature and extent be capable of explaining the disturbance of function, we regard it as the cause

of the symptoms observed. If, on the contrary, disturbance of function have existed, without the organ having undergone appreciable modification of texture, the functional error must be ascribed to some sympathetic influence, or to the general condition of the individual. Thus, although loss of appetite be one of the symptoms of gastritis, as it is not unfrequently observed in phthisis, without any appreciable change in the mucous membrane of the stomach, we are forced to conclude that, under these circumstances, the anorexia is sympathetic or dependent on some general condition of the system, as for example, upon febrile action. And it is, further, a just inference that a function may be deranged even for a considerable time, without alteration of structure of the organ performing it being discoverable.

Nothing can be more simple, nor at the same time more laborious, than this method of drawing general inferences,—for it requires the construction of an immense number of tables, and the performance of numerous analyses of symptoms. The work which I now present to the reader is scarcely more than this almost mechanical survey and examination of the facts I have collected. I am intimately persuaded that the most useful work on any given subject must be none other than a perfectly faithful analysis of the greatest possible number of facts bearing upon it, and on this conviction I have acted.

The cases on which the present work is founded are one hundred and twenty-three in number. I have inserted fifty of these in the course of this volume, as documents of evidence; and as, in my opinion, the history of a patient is not perfectly complete, unless it gives at least a succinct idea of the state of all the functions, I have described, as briefly as possible, the condition of every organ in every case. This appeared to me to be the more indispensably necessary, because almost all these cases are instances of complications, more or less numerous, —because their reciprocal influence stood in need of investigation,—because had I confined myself to the examination of any single order of symptoms, I should have been obliged also, in the exposition of morbid changes, to have limited myself to a single order of organs,—because such mode of procedure would have deprived my cases of some of their interest, and lastly, because they might have been, in consequence, regarded as

having been negligently recorded. Besides, as my researches bear upon a considerable number of points, many of them would have appeared deficient in solidity of basis, had I in each case confined myself to details connected with a single particular.

In order to lessen the tediousness of their perusal, I have drawn up all my cases on the same plan, as follows. In the first paragraph I relate the condition of the functions between the commencement of the patient's illness, and his admission into hospital; in a second are enumerated all peculiarities detected in a state of the various functions when I saw the patient for the first time; and then a separate paragraph is devoted to the description of the varying state of each of those functions till the occurrence of death. The external appearances of the body, and the various unusual conditions observed in the head, the neck, the chest, and the abdomen are next described in separate paragraphs. In this manner, all confusion is avoided, each subject has its own particular place, and if the reader be desirous of ascertaining what symptoms depended upon any given morbid change, he is only obliged to go through a single paragraph.

Finding it impossible to relate all the cases which form the foundation of these researches, I have formed a somewhat different arrangement of my subjects, from what I should otherwise have done. I have divided the work into two parts, and as anatomy is the firmest support of pathology, I have commenced this analysis with a general description of the morbid changes of the various organs. I have successively made known those of the lungs, the bronchi, the pleura, the trachea, the larynx, and the epiglottis; and then turned to those of the digestive organs, &c. And as I felt the importance, not only of describing all these morbid changes, but also of ascertaining whether those seated in other organs besides the lungs were proper to phthisis, I ascertained the condition of things in this respect in subjects cut off by other chronic diseases indiscriminately, and whose cases I had collected. I compared the two series of cases together, and from this comparison, have been deduced some additional general facts, which are not without their importance.

I have stated the proportion of cases in which every morbid change was observed; so that my work supplies in all its parts, a sort of statistical view of phthisis.

I have, at the close of the description of almost all the various alterations of structure, inquired into their probable cause.

Lastly, I have in a brief Summary, placed before the reader the entire of the facts passed in review in the First Part.

The Second Part is devoted to the history of the symptoms. It opens with the exposition of those of phthisis free from complication of any kind, and I have here dwelt particularly upon the diagnosis of the disease during its first period; I have then passed in review the symptoms attending ulceration of the epiglottis, larynx, and trachea, those depending upon the various textural changes of the mucous membrane of the stomach, &c. I have next inquired into the anomalies in respect of acute and latent course sometimes occurring in cases of phthisis; traced a description of the phenomena following perforation of the pulmonary parenchyma, from irruption of tuberculous matter into the pleural cavity; related several cases of sudden death; endeavoured, by collation of facts, to ascertain the real influence of some of the causes to which the development of pulmonary tubercles is ascribed; and lastly, succinctly detailed the treatment to which the patients, whose cases I have analysed, were submitted.

My first intention was to produce a simple essay, and consequently, only to relate a small number of cases; but had I acted upon this intention, several of my propositions would have remained unproved, and I should have neglected the most essential duty of the writer, whatever be the subject which he undertakes to elucidate. It was by the advice of M. Chomel, that I was led to give greater latitude to these researches, and I am happy to have it in my power here to express my gratitude for his counsels.

Finally—and I say this with full conviction of its truth—a more able hand might have thrown a deeper interest over the long series of morbid changes and symptoms I have described; but none could have been more impartial or more elaborately cautious, as to the accuracy of the facts themselves and the inferences drawn from them.

Paris; October 1, 1825.

CONTENTS.

PAGE

Dedication v

Note by the Translator vii

Author's Advertisement to the Second Edition . . . xi

Author's Advertisement to the First Edition xxii

PART I. PATHOLOGICAL ANATOMY.

CHAPTER I. Organs of Respiration 1

Section i. The Lungs 1

ii. The Pleuræ 35

iii. The Epiglottis, Larynx, and Trachea . . . 38

§ 1. Ulcerations of the Trachea 39

§ 2. Ulcerations of the Larynx 41

§ 3. Ulcerations of the Epiglottis 41

CHAPTER II. Organs of Circulation 48

Section i. Heart and Pericardium 48

ii. Aorta 52

PAGE

CHAPTER III. Organs of Digestion 56

Section i. Pharynx and Œsophagus 56

ii. Stomach 57

§ 1. Size and position of the stomach . . . 57

§ 2. Softening, with attenuation of the mucous membrane of the stomach 58

§ 3. Redness, with thickening and mammillation, or diminution of consistence of the mucous membrane in the situation corresponding to the anterior wall of the stomach . 60

§ 4. Redness and softening of the mucous membrane of the fundus 61

§ 5. Mammillation, with grayish or reddish discoloration of the mucous membrane of the stomach . . 62

§ 6. Ulcerations of the mucous membrane of the stomach . 63

§ 7. Other morbid changes of the mucous membrane of the stomach 64

Section iii. Duodenum 66

iv. Small Intestine 67

§ 1. Mucous membrane of the small intestine in the natural state 68

§ 2. Small intestine in the morbid state . . . 71

Section v. Large Intestine 82

CHAPTER IV. Lymphatic Glands 90

Section i. Cervical Glands 90

ii. Bronchial Glands 91

iii. Mesenteric Glands 93

iv. Meso-cæcal, meso-colic, and meso-lumbar Glands . 96

CHAPTER V. Biliary Organs 98

Section i. Liver 98

ii. Bile and vesicula fellis 103

CHAPTER VI. Spleen 105

VII. Urinary Organs 107

PAGE

CHAPTER VIII. Genital Organs 113

Section i. Male Genital Organs 113

ii. Female Genital Organs 118

CHAPTER IX. Peritoneum 122

X. Brain and Membranes 133

SUMMARY 149

PART II.

CHAPTER I. Semeiology 155

Section i. Cough 161

ii. Sputa 162

iii. Hemoptysis 166

iv. Dyspnœa 175

v. Pain 176

vi. Fever 179

vii. Thirst 182

viii. Gastric symptoms 183

§ 1. Gastric symptoms in subjects having the mucous membrane of the stomach softened and attenuated . . 183

§ 2. Gastric symptoms in patients in whom inflammation of the mucous membrane of the stomach was limited to its anterior surface 191

§ 3. Gastric symptoms in subjects in whom the fundus of the stomach was red and softened . . . 197

§ 4. Gastric symptoms in subjects in whom the mucous membrane of the stomach exhibits simple ulcerations . . 201

Section ix. State of the Tongue 216

x. Diarrhœa 222

xi. Chronic Peritonitis 226

PAGE

Section xii. Symptoms of Ulceration of the Epiglottis, Larynx, and Trachea 247

§ 1. Symptoms of ulcerations of the epiglottis . . . 249

§ 2. Symptoms of ulcerations of the larynx . . 260

§ 3. Symptoms of ulcerations of the trachea 262

Section xiii. Pneumonia 274

xiv. Pleurisy 276

xv. Genital Functions 278

§ 1. In males 278

§ 2. In females 278

Section xvi. Cerebral Symptoms 280

xvii. Function of Hearing 307

xviii. Emaciation 308

xix. Symptoms of Perforation of the Parenchyma of the Lung, produced by bursting of a tubercle into the cavity of the pleura 309

CHAPTER II. Course of Phthisis 351

Section i. Acute Phthisis 351

ii. Cases of sudden death 389

§ 1. Cases of sudden death, explicable in a more or less plausible manner by the state of the organs after death . . 389

§ 2. Cases of unexpected death, which are not explicable by the condition of the organs after death . . 395

Section iii. Latent Phthisis 408

CHAPTER III. Diagnosis 435

Section i. First Period 435

ii. Second Period 464

CHAPTER IV. Termination and Prognosis of Phthisis . . 472

V. Etiology 477

Section i. Predisposing or Remote Causes 477

ii. Exciting Causes 494

PART III. TREATMENT.

PAGE

CHAPTER I. Appreciation of the principal means which have of late years been brought forward, as best calculated to arrest the progress of Phthisis . 509

Section i. Protioduret of Iron 509
ii. Chloride of Sodium 512
iii. Subcarbonate of Potass 515
iv. Sal ammoniac 515
v. Chloride of Lime 516
vi. Chlorine Gas 517
vii. Digitalis 533
viii. Hydrocyanic Acid 535
ix. Creosote 536
x. Iodine 537

CHAPTER II. Treatment 538

Section i. Prophylactic Treatment 539
ii. Palliative Treatment 544
§ 1. Chronic Phthisis 544
First Period 544
Second Period 557
§ 2. Acute Phthisis 565

[The English measures, given in the following Translation, are in all cases to be regarded as *mere approximations* to the true values of the French quantities, beside which they are placed. These true values the reader may, in each instance, readily ascertain for himself, by means of the following table, taken from Thompson's British Annual for 1837. The litre is valued in other works at 2·1135 pints.

The reader is requested to observe, that in the text the line is supposed to be one twelfth of the English inch.

French Measures of Length.	*English Inches.*
Meter	39·370
Decimeter	3·937
Centimeter	0·393
Millimeter	0·039
Measures of Weight.	*English Grains Troy.*
Gramme	15·438
Decigramme	1·543
Centigramme	0·154
Measures of Capacity.	*English Pints.*
Litre	1·760]

RESEARCHES ON PHTHISIS.

PART I.

PATHOLOGICAL ANATOMY.

I SHALL devote this Part to the description of the anatomical changes observed in the various systems of organs, and subjoin some considerations on their causes.

CHAPTER I.

ORGANS OF RESPIRATION.

SECTION I.—THE LUNGS.

BAYLE established as many species of Phthisis as there exist organic alterations of the lungs, capable, according to his views, of producing death as a consequence of their development: he admitted a tuberculous, a granular, a cancerous, a melanic, a calculous, and an ulcerous phthisis. Laennec maintains, on the contrary, that there is but one species of phthisis—the tuberculous; in other words, but one single organic change of the lungs capable of destroying life by inducing physical wasting in all its stages, together with the series of symptoms characteristic of phthisis. I have now devoted myself for upwards of twenty years, with more or less assiduity, to clinical observation, and during this period I have not met with a single instance of an individual, dying phthisical, whose lungs did not present, as their chief morbid change, a greater or less number of tuberculous cavities, tubercles, or semi-transparent

gray granulations. My observations consequently confirm those of Laennec, and I agree with him in recognizing tubercles in the lungs as the anatomical character of phthisis.

Tubercles, it is well known, are tumours of yellowish white colour, of dull aspect, free from glossiness, and of variable consistence;—tumours which soften after a certain time, are evacuated into the bronchi, and leave cavities of variable size in their room.

As observed by myself they were almost always more numerous, larger, and more advanced in development at the apex than the base of the lungs; among the cases analysed in this work—one hundred and twenty-three in number—two only furnish exceptions to this rule. (Case xxxvii.)

Associated with these tubercles appeared productions of a very different aspect,—small bodies, more or less rounded in shape, homogeneous, glossy, of some considerable consistence, varying in size from that of a pea to that of a millet-seed, and known by the name of the gray semi-transparent granulation.

These granulations constitute, it would follow from the admirable researches of Laennec, the first stage of tubercles,—a stage through which the latter must necessarily pass before acquiring their own peculiar characters. Like tubercles, I have found these bodies of larger size and in greater numbers at the apex than the base of the lungs, and, unless when pervading the entire mass of those organs, limited to their apices.

At a certain period of their existence the productions in question exhibited a yellow opaque spot at the centre, and this spot was larger in proportion as the granulations were themselves closer to the apices of the lungs; in such manner that when these organs were examined from below upwards, there were commonly found in regular order gray semi-transparent granulations, granulations of opaline aspect and yellowish tint in their interior, and lastly, granulations of a yellowish white hue, throughout their entire substance,—in other words, completely tuberculous. The latter were generally the only species met with at the apices.

In the great majority of instances, tubercles and gray semi-transparent granulations coexisted in the same organs. I have in truth met with but one case in which the former were present without the latter, and but five examples of the de-

position of the gray granulation without tubercle. In these latter instances, too, some of the granulations had already acquired slight opacity and a yellowish tint in the centre.

These facts appear to me to establish incontestably the transformation of the gray semi-transparent granulation into tuberculous matter.

The granulations, though usually scattered, were in many cases collected into small groups, or even formed masses of irregular form and variable size.

They were usually placed at some distance from the pleura; but sometimes (in about one third of the bodies examined) were not less numerous immediately underneath that membrane than in the deeply-seated parts of the organ. I have even met with one case in which, although the lung was perfectly free from adhesions, they existed in greater abundance at its surface than elsewhere. (Case XI.) This mode of deposition of the granulations rendered the outline of the lungs uneven. Converted into tuberculous matter, and subsequently softened, they terminated in abscesses forming prominences on the surface,—abscesses which sometimes burst into the cavity of the pleura and then occasioned a series of symptoms, to be enumerated in the chapter descriptive of Perforation of the Lungs.

In a fair proportion of cases the natural transparency and tenuity of the pleura were unaltered opposite these little abscesses; and hence the latter, on first sight, resembled a hugely dilated vesicle much more closely than a small tuberculous cavity.

The time necessarily elapsing between the first deposition of the gray granulation and its enlargement to the size of a small pea (the bulk most commonly observed,) is without doubt extremely variable, and almost always incapable of determination. Nevertheless some cases of acute phthisis appear to indicate that their development is occasionally extremely rapid, and that they may acquire the dimensions in question within the space of two or three weeks. (Case XXXVIII.) On the other hand, a considerable number of cases justify the notion that, long after their origin, they may still be of very small size. Thus, I have met with several individuals who had laboured under continual cough and been subject to attacks of

hemoptysis for many years, &c.,—persons whose lungs presented no other alteration of their parenchymatous structure than gray granulations of the bulk mentioned, or even considerably smaller.

The gray semi-transparent matter also exhibited itself frequently under another aspect—that of shapeless masses, occasionally of considerable size, as large, for example, as a hen's egg and upwards. (Case LII.) As in the cases where it had assumed the globular form, it was glossy, homogeneous, and destitute of distinct structure. In several instances a variable number of miliary spots, of yellowish-white colour and dull aspect—in fact, essentially tuberculous—were discernible in the midst of the masses referred to. In others the transformation was almost complete, and a few particles only of gray matter appeared in the midst of a mass of tuberculous substance.

Thus, whether the gray matter presented itself under the form of granulations or of irregular masses, which had attained more or less considerable bulk, it sooner or later underwent the tuberculous transformation.

I have, further, detected the gray matter in both its principal forms in other organs besides the lungs, and in them also found it susceptible of the tuberculous transformation. In illustration of this fact I may refer to the subject of Case VII: in this individual masses of gray semi-transparent matter were contained in the midst of a large quantity of tuberculous deposit accumulated in the great omentum and mesocolon. Is it not probable that the matter in question would eventually have been converted into tubercle?

In corroboration of a remark made by Laennec, I may observe that vessels were either not discoverable at all, or but rarely discoverable in the masses of gray matter; of this I have satisfied myself several times by means of injection. (Case LII.)

When the tuberculous cavities observed were even of tolerable extent, they were almost invariably surrounded by a certain quantity of this same gray matter; in many cases too, when there existed opaline yellowish granulations, it inclosed these on all sides, uniting them into a mass of variable compactness. Under these circumstances I observed it in three cases under the singular form of zones. There were three of

these placed horizontally and parallel to each other; they occupied the whole depth of the lungs, were an inch and two lines [3 centimeters] broad, and separated from each other by a stratum of pulmonary tissue of the same dimensions. (Case XLV.)

Like the granulations, the gray matter accumulated in masses was frequently placed near the surface of the lungs, immediately underneath the pleura. (Cases XL, LII.)

In cases of phthisis, distinguished by rapidity of progress, it might be supposed that the tuberculous matter was not the product of a transformation of the gray substance, but rather developed primarily under that form; and for the simple reason that the time necessary for the accomplishment of the change would appear to have been deficient. Such, for example, might be considered the fact in the instance of the young girl whose history is given further on (Case XL), and in whom, though the affection terminated fatally so early as the thirty-fifth day, I discovered a very large mass of softened tuberculous matter, with the evidence of partial evacuation besides. However, it must not be forgotten that, in this case, there were both gray matter and tuberculous deposit in the same lung; that in several other subjects whose malady ran a very rapid course (Case XLI), a certain quantity of gray matter was discoverable in the midst of one of the upper lobes, itself converted into tuberculous substance; and further, that although the development of the former may have taken place subsequently to that of the latter product, still the converse is no less probable: hence the unavoidable inference that in these several cases the true course of the affection must be regarded as undetermined.

It is not rare, it must be confessed, to meet with tubercles unassociated with gray granulations in the other organs of the body; still even in these both products very frequently coexist. Nay, more, as we shall hereafter see, gray semi-transparent granulations are sometimes found, quite independently of the presence of tubercles, in other viscera besides the lungs; so that if tubercle do actually occur in the organs as a primary development, it would certainly appear to do so in the minority of cases o ly.

I have further observed in the lungs of phthisical persons, and of these alone, a peculiar matter, less firm and less trans-

parent than that just described, of reddish colour, or occasionally almost colourless, and presenting more or less of the general appearance of jelly. (Case II.) I have never detected tuberculous particles in this matter, for the description of which we are indebted to Laennec. I am doubtful whether it can be considered identical in nature with the gray semi-transparent matter.

Both lungs contained, in almost every case, a greater or less number of tubercles. In five instances, however, I found the morbid change limited to the left lung, and in two only to the right. Can this circumstance be regarded as evidence of somewhat less proneness on the part of the latter, than of the former, organ to become the nidus of tubercle?

I have already mentioned that the tubercles affected a kind of preference for the apices of the lungs, and were, in this situation, larger, more advanced in point of development, and proportionally more numerous, than elsewhere. This statement is even more accurately true of the upper as compared with the lower lobe, than of the lungs in general; for, not to speak of large cavities, which are almost peculiar to the apex of the upper lobe, gray granulations, tubercles, small cavities, &c. occur in greater numbers and in closer proximity to each other in the rest of that division of the organ, than in the corresponding part of the lower lobe. I have indeed often found the entire upper lobe studded with cavities, transformed into gray or tuberculous matter, and throughout impermeable to air, while parts of the lower lobe on the same level were but rarely excavated, and constantly contained some amount of tissue capable of sustaining respiration. One of my cases of acute phthisis exemplifies the condition of things now referred to, (Case XLI); I have observed it, very closely with the characters described, in thirty-eight subjects, or in about one third of those examined, twenty-eight times on the left and ten only on the right side. This fact, again, appears to show a greater tendency on the part of the left lung to the development of tubercles than the right, and is in harmony with that noted in the preceding paragraph. The phenomena of perforation of the parenchyma of the lung give evidence in the same direction; of eight examples of this morbid state (the only ones I have collected,) seven were observed on the left side.

There are certain cases in which, as has been remarked by M. Chomel, the gray matter formed in the upper lobe of the lungs appears to be a product of chronic inflammation. It is no doubt true that the granular aspect which, according to the observations of Laennec, forms the anatomical character of pneumonia in its second and third stages, is under these circumstances no longer to be detected; but this gray matter has an opaline look that cannot be ascribed to miliary granulations, inasmuch as these are not present; it is traversed by white, thick, cellular septa, quite as distinct as those of pneumonia, and is more compact than the common gray matter: these peculiarities, when well marked, appear to me sufficient to distinguish the two kinds of anatomical change. As to the deficiency of the granular aspect, there is no reason why this should not be among the effects of time,[1] which induces such notable changes in the characters of every species of anatomical alteration.

M. Grisolle takes the same view of the nature of this morbid state in his admirable treatise on Pneumonia, and observes that it is not rare to find gray granulations, or even crude or softened tubercles, on the surface of parenchyma thus diseased.[2]

I have but once met with encysted tubercles: they were seated in the upper part of the superior lobes, and were very easily separable from the surrounding tissue. (Case LIV.)

The process of *softening* of the tubercles was effected at very different periods; in some cases from the twentieth to the fortieth day, counting from the outset of the disease (Case XXXVII); generally much later. The change commenced in the centre

[1] This opinion originates with M. Andral. M. Andral also believes the pulmonary vesicles to be the intimate seat of pneumonia, a notion affording a ready explanation of the granular aspect of the lungs in that affection. This ingenious idea appears to me more than a mere hypothesis; for when the bronchi are gently and cautiously injected, an infinite number of little masses are found in the lungs, presenting on section precisely the granular aspect under consideration, whereas if the injection have been pushed with greater force, the lungs exhibit the appearance of a compact mass, having almost completely lost that peculiar aspect. It would appear to me that this experimentum crucis renders the cause of the granular aspect in acute pneumonia evident, as likewise that of its disappearance, when the disease has passed to the chronic state.

[2] Traité pratique de la Pneumonie aux différents âges, et dans ses rapports avec les autres maladies aigües et chroniques. Paris, 1841, p. 88.

of the little mass, and, in this respect resembling the conversion of the gray into tuberculous matter, advanced from the apex to the base of the lung; so that proceeding in his examination from above downwards, the observer might successively discover cavities, softened tubercles, crude tubercles, and gray semi-transparent granulations.

Instead of being a process gradually effected, softening occasionally took place simultaneously in every part of a considerable mass of structure; and an entire lobe, converted into tuberculous matter, presented throughout nearly the same amount of softness and friability. These cases were of rare occurrence, and always belonged to the category of acute phthisis (Case XLI); and even in them some imperfectly formed cavities appeared at the apex of the upper lobe,—the remainder of which was tuberculous and very uniformly softened.

M. Reynaud, in his 'Essay on Phthisis in the Quadrumana,' mentions his having met with a case of this kind in the person of a young man, aged fifteen. Here the left lung was almost universally adherent to the costal pleura and pericardium, and when divided from the base to the apex exhibited an enormous cavity in its upper half, and a transformation of the remainder of the organ into a compact mass of yellowish-white colour and tolerable firmness, appearing smooth when cut, granular when torn, and breaking down under the fingers very much as crude and firm tuberculous matter. The vesicular structure of the lung had totally disappeared, and, with the exception of a few open empty vessels of tolerably large caliber and some good sized bronchi, there were no appreciable traces to be found of blood-vessels and permeable bronchial tubes. All the small bronchi were filled with a whitish, slightly elastic substance, which in the larger tubes assumed the characters of tuberculous matter.[1]

The vitality of a mass so completely disorganized, observes M. Reynaud, might naturally be made matter of question; the lung, in such a condition as this, may in truth be regarded as but little more than dead matter,—a mere foreign body destined to be eliminated, were there sufficient vigour in the system to effect its removal.

I have not met with fully-formed tuberculous cavities at an

[1] Archives de Méd., t. xxv, p. 303.

earlier period than the end of the third, or commencement of the fourth, month from the outset of the disease. At this period the walls of the cavities were, generally speaking, smooth, and lined with pseudo-membrane of slight consistence, easily separable from the surface: in very rare cases the pulmonary tissue was exposed. When the disease was of longer standing, and the cavities older, (which was ascertainable by accurate investigation of the symptoms and the comparative results of auscultation,) their walls were almost invariably more or less hard and formed of tubercle, gray semi-transparent matter, or in some instances melanosis. These different morbid formations, either separated from each other by a little healthy pulmonary tissue or actually continuous, appeared variously combined. The membrane investing the cavity was dense, grayish-coloured, almost semi-transparent, semi-cartilaginous, about a quarter of a line [half a millimeter] (a little more or a little less) thick, and generally itself lined with a second membrane; this latter rarely formed a continuous tract, and was extremely soft, and of yellowish or whitish colour. In one fourth part of my cases neither of these membranes could be found, the pulmonary tissue, more or less completely altered in properties, being perfectly bare and uncovered.

Whether large or small, and whether they were recently formed or had existed for a considerable time, the cavities communicated with the bronchi by a variable number of openings. The pseudo-membrane of the former and the mucous tunic of the latter were closely united at the orifices of the cavities; and when the walls of these had become red, the limits of each could only be ascertained by means of careful dissection.

Cavities of old formation differed, further, from those of recent origin in their being uneven on the surface and anfractuous, while they usually communicated with others of smaller dimensions.

It was not uncommon to find the cavities crossed in various directions by bands, varying in length and thickness, uneven, from one to two lines [2 to 4 millimeters] broad, thinner in their middle part than at either extremity, and formed of gray matter studded with tubercles. Although vascular ramifications could rarely be detected in them, I observed these in five cases with or without the aid of injection. (Case LIV.)

The existence of these bands is an actual proof of the destruction of some portion of the surrounding tissue, and would in itself suffice to show that the disappearance of some amount of pulmonary tissue is a necessary condition for the generation of large cavities. The open orifices of bronchi at the periphery of the cavities, the obliteration of vessels near their walls, as well as the direction pursued by the remnants of those vessels, plainly indicating their previous passage through the now empty space, are so many additional proofs of the fact.

Laennec's opinion that the gray granulation originates in the interstices of the pulmonary parenchyma may be correct; but when these bodies are placed in more or less close proximity, and have given rise to the development of gray semi-transparent matter forming a bond of union between them, there is here too, in a very evident manner, destruction of tissue; the parenchyma originally comprised between the granulations has disappeared. Hence the inference, that the existence of cavities of small size, as well as of those of considerable dimensions, involves the destruction of pulmonary tissue.

The large tuberculous excavations of the upper lobe were closer to the posterior than the anterior surface of the lung; and in many cases I have found their posterior wall formed almost solely of a semi-cartilaginous pseudo-membrane, one line or one line and a half [2 or 3 millimeters] thick, investing the apex of the organ. Inferiorly, a thin stratum of diseased pulmonary tissue sometimes alone separated them from the pleura of the interlobular fissure (Case LI); or their walls were even destroyed in this direction, and they themselves communicated with another cavity situated in the posterior part of the lower lobe. It is worthy of note, that in no instance did I meet with large cavities in the centre of the inferior lobe.

The following case supplies a very remarkable example of the state of things just referred to, as also of the magnitude sometimes attained by tuberculous excavations.

CASE I. A girl, aged 20, of rather delicate constitution, but generally enjoying good health, was admitted into the Hospital of La Charité, the 24th August, 1824. She was still growing, and had had a favorable confinement upwards of eight months before.

With the exception of occasional epigastric pain, from which she had already suffered during pregnancy, her health continued good for the first two months after her confinement; after this she was seized with all the symptoms of phthisis. The cough and expectoration had set in together, and became more troublesome within the last two months. In addition to this increase of the two principal symptoms appeared considerable oppression and pain between the shoulders and at the central part of the sternum. There had only been very slight hemoptysis. Weakness of the voice noticed within the last fifteen days, had increased into a state of aphonia; the appetite had been variable from the outset; there was frequent nausea; the abdomen felt more or less painful, and during the last twenty-four days the patient occasionally vomited independently of fits of coughing. For the last four months there had been constant diarrhœa, great heat of skin, with considerable night-sweating, and progressive emaciation. Rigors, one of the first symptoms, had recurred almost every day during the further course of the disease.

April 25th. *Present state.* Face pale, and expressive of exhaustion; slight headache; insomnia (as for the last three months); intelligence unaffected; cough tolerably frequent; sputa of greenish colour, somewhat nummulated, and few in number, exhaling the same sickly smell as the patient's breath; voice weak and slightly changed in character; percussion clear and painful under both clavicles; pectoriloquy with metallic tinkling accompanying the cough, inspiration and expiration under the right clavicle;—tongue natural; impaired appetite, with sensation of weight at the pit of the stomach immediately after eating; constant pain in this region; hypogastric tenderness; three stools with colic pains yesterday; pulse small, weak, and extremely rapid; slight heat of skin; night-sweats; extreme weakness; marasmus in its most advanced stage. The patient's case had been given over as hopeless, and she came to the hospital expressing strongly her anxiety to be cured. She lay upon the left side.

27th. Complained of rather a sharp pain in the right side of the chest; and at 3 p.m. on the 28th, expired almost without a struggle (sans agonie), retaining her consciousness to the last.

Sectio Cadaveris; *forty hours after death.*

External appearances. Marasmus in its last stage. Nothing else worthy of note.

Head. Two small spoonfuls of serosity in the upper part of the arachnoid cavity; pia mater a little red; brain healthy; half a table-spoonful of transparent serosity in each lateral ventricle.

Neck. Epiglottis, larynx, and trachea natural.

Chest. Firm and tolerably thick adhesions between the right lung and costal pleura, extending over the greater part of the surface of the organ, at its apex and posteriorly. Removal of these adhesions from the external surface of the organ displayed a broad deep hollow, resulting from the presence of an enormous cavity, occupying three fourths or four fifths of the entire mass of the lung, extending from the apex to within nearly ten lines [2 centimeters] of the base, and from the posterior border to within about five lines [1 centimeter] of the anterior. This cavity contained a turbid matter, moderately thick, of grayish-brown colour, and exhaling that kind of fætor given off by animal matters undergoing maceration. Its walls, remarkably anfractuous, gave attachment in various places to shreds of pulmonary tissue totally changed in properties, and on the point of dropping away from their connexions; the walls were not invested with false membrane, and measured at their external aspect from one to three lines [2 to 6 millimeters] in thickness, or in some parts much less even. Opposite the interlobular fissure the cavity was divided into two unequal parts by a septum largely perforated in several places, and composed, like the rest of its walls, of a grayish matter (or in some spots blueish and semi-transparent,) studded with tubercles. The right bronchus, much wider than the left, opened into this enormous excavation almost immediately after its entry into the lung, and at six lines' [12 millimeters] distance from its own origin. The rest of the organ contained gray granulations and tubercles in abundance, in such manner as to leave scarcely a tenth part of its entire structure permeable to the air.—The apex of the *left* lung adhered slightly to the costal pleura, and contained a small cavity, which might have held a walnut, surrounded with gray semi-transparent matter, and, in great abundance, with tubercles. Beneath this the upper lobe contained an abundance of semi-transparent gray

granulations, collected into small masses, many of which were placed so close to the pleura as to form nodules of some size on the surface. There were very few in the lower lobe.—The *heart* was healthy; the aorta generally red,—the redness extending (and gradually losing its intensity) into the carotid and femoral arteries. The thickness and consistence of the coats of these vessels were not obviously changed.

Abdomen. Liver large, of a buff yellow colour, partially overlapping the stomach; of moderate consistence, and somewhat fatty; bile thick and tenacious.—The stomach of natural size, displayed a blueish tint externally in the situation corresponding to the great curvature. Although separated with the very greatest care from the spleen and adjacent parts, it presented, a little to the left of and behind the cardia, a perforation something more than an inch [nearly 3 centimeters] in diameter, with extremely thin and colourless edges, formed of peritoneum and a very delicate stratum of submucous tissue. Viewed internally, the greater part of the fundus and of the anterior surface appeared of a blueish white colour with broadly marked veins; the mucous membrane was here as soft as mucus, and as thin as blotting-paper. This tissue exhibited the same species of morbid change in the remainder of its extent, under the form of bands from three to four and a half lines [6 to 9 millimeters] broad; between the parts thus affected the membrane was moderately red and firm. With the exception of ten very small ulcerations near the cæcum, the mucous membrane of the small intestines had the characters of perfect health; here too, and between the mucous and submucous tissues, were some whitish bodies a little larger than millet-seeds, but not manifestly of tuberculous nature. In the large intestine the membrane was pale, free from ulceration, somewhat thickened, and as soft as mucus.—The mesenteric glands were healthy; the spleen rather soft; the uterus very small, measuring only about one inch and four lines [32 millimeters] in its transverse diameter.—Other organs natural.

The clear sound emitted by the chest under percussion beneath the right clavicle, combined with the pectoriloquy and metallic tinkling audible in the same place, announced the presence of an extensive cavity in this region. Still I was far

from imagining it as large as it proved to be. No doubt, had I not been prevented by the patient's weakness from ascertaining the state of respiration posteriorly, I might have obtained additional information respecting its size; but even so, it is extremely probable I should not have come to a perfectly correct conclusion, but attributed to a great number of cavities communicating with each other the phenomena in reality dependent upon one. The imperfect septum at the upper part of the cavity was formed by the adhesion of the corresponding parts of the upper, middle, and inferior lobes, themselves diminished extremely in thickness in this situation. The semiputrid shreds adhering to the walls of the cavity, and the odour of the fluid it contained, identical with that of the sputa, were no less remarkable than its size. The same remark may be made respecting the dilatation and shortness of the bronchus opening into it; and it is conceivable that, under such circumstances, shreds of lung may be voided by expectoration. Certain statements made by the patient's mother would lead to the belief that some fragments of pulmonary tissue had actually been seen among the sputa, a few days before her admission. But patients and their friends are too prejudiced observers to justify us in accepting their simple testimony as conclusive of a fact of this description.

It is further worthy of note that, notwithstanding the extent of the diseased changes, there had been but very trifling hemoptysis; that the affection had run a rapid course; and lastly, that the case supplies an apt illustration of the great difference pretty frequently observed in the amount of disease in the two lungs of phthisical subjects.

In reference to the last remark, it may be observed, that although there were cavities in both lungs in the majority of instances, this was not invariably the fact: in one sixth part of my cases they were limited to one or other lung, and when present on both sides were of different size, Again, in somewhat less than one tenth of my cases, both lungs were the seat of enormous excavations, equally large on both sides; and in another tenth, where the cavities presented but small or moderate dimensions, these dimensions were the same in both organs.

Under the term *large,* I comprehend such cavities as

equalled in size that of a goose's egg or of the clenched fist of the individual, or had attained even greater magnitude. Cavities of this description existed, either on the right or left side, in about one half of the cases, and with equal frequency in each lung. Under the head of *medium-sized* excavations I class those equalling, or nearly equalling, a moderately large apple in dimensions; I term those of the size of a small walnut *small:* cavities belonging to both these classes were nearly equally distributed through the remainder of the subjects.

Several circumstances appear to have influenced the nature of the materials found in the cavities; among the principal of these were the time of duration, or age, and structure of the cavity, and possibly also the variable amount and duration of obstruction of the circulation at the close of existence. When of recent formation, their contents were thick and yellowish, like ordinary pus; if they were old, and more especially if anfractuous and deficient in lining false membrane, the fluid exhibited a greenish gray colour, and dirty disagreeable aspect,—it was thin, of moderate consistence, and sometimes tinged with blood, or even deeply reddened. I entertain no doubt that the latter tint was produced a few hours only before death; for while it was far from unfrequently noticed at the post-mortem examination, sputa of red colour were extremely rare the last or the last two days of life.

Although the contents of the cavities were commonly without smell, they sometimes exhaled that of animal substance in maceration,—an odour in nowise dependent on the dimensions of the excavations, as these were sometimes as large as a fourth or fifth part of the lung in instances, where it was not observed. Nor did it depend, at least solely, on the action of the air; for there was always air present in their interior, and I detected this smell in three cases only. In the case which I have just narrated, it appeared to arise from the mortification of some shreds of gray matter, partially detached from the parietes of the cavity; in the two other cases no peculiarity of this kind existed,—the cavities were anfractuous, but nothing more.

I met with one case in which a tuberculous cavity of moderate dimensions, instead of containing air or pus, was filled with fibrinous substance in a state of organization;—the case is sufficiently curious, it appears to me, to deserve full description here.

Case II. A street-organ player, aged 22, of moderately strong constitution, middle height, and quick temper, was admitted into the Hospital of La Charité, the 24th April, 1824. He had been ill for a year and eight months, ceased to follow his occupation, for the last year, and kept his bed from time to time the last three weeks. He ascribed his illness to having drunk a glass of cold water when heated. His earliest symptom had been dry cough, with oppressed breathing; no expectoration occurred until the second month, nor, until the last eight days, had there been any hemoptysis. At this period, while walking quietly, the patient was seized, without previous fit of coughing or any assignable cause, with sudden hemoptysis, so violent that, according to his statement, he vomited twenty-four ounces of blood in less than twenty minutes; after which the sputa had only been more or less deeply tinged red. He had had rigors, heat, and perspirations for the last nine months. The appetite had failed but very slightly, although the cough frequently brought on vomiting. There had been attacks of diarrhœa, each of a few days' duration, at long intervals. He began to lose flesh from the outset.

August 25th. *Present state.* Marked emaciation; skin, especially that of the face, slightly yellowish; oppression of breathing moderate; cough not frequent; sputa opaque, tinged with blood or of mahogany colour,—the patient fancied he felt them detach themselves from the left side of the chest, and at each jar caused by the cough experienced a slight pain (which had existed from the commencement) at the lower part of the same side. Percussion dull over a surface two inches and four lines [6 centimeters] high, under the right clavicle, and in the entire region corresponding to the upper lobe on the left side. In these situations there was manifest pectoriloquy with tracheal respiration, accompanied on the left side with abundant gurgling. Between the shoulders similar signs were discovered by auscultation. The pulse was rather rapid, small, and weak; the skin rather below than above the natural temperature; the appetite moderate, no unnatural thirst; digestion easily performed; the abdomen yielding and free from pain; one stool of good consistence daily.

Pectoral ptisan; gum potion; quarter of house allowance, without wine.

Sept. 1st. Appetite increased; pain in the left side more constant and severe than usual.

In the evening this pain was greatly relieved; but he was attacked with pain of considerable severity in the hypogastrium and throat; breathing and expectoration as before. The patient declared that his complaint was wholly seated in the left side; no change in the character of the voice, nor disagreeable sensation in the course of the trachea.

On the 11th, the difficulty of breathing became more distressing, and during the night the patient was obliged to assume the sitting posture, and afterwards leave his bed altogether, with the view of relieving the dyspnœa.

On the morning of the 12th, he felt an extraordinary sensation behind the left clavicle, which gave him the idea of there being a hole there; the dyspnœa had grown extreme; appetite almost completely gone; the bowels continued regular however; he complained of severe abdominal pain, and sat upon a chair, with his body bent forwards, in a state of extreme distress.

These symptoms continued; the breathing grew excessively frequent; the sputa retained their previous characters; there was constant abdominal pain, more or less violent; and on the night of the 16th he expired without having had delirium.

He had risen from bed without assistance on the morning before his death. On that and the previous day, I had failed in detecting pectoriloquy under the left clavicle; twenty-four hours before, the patient said he had heard a dreadful rattle in that situation.

Sectio Cadaveris; *thirty-two hours after death.*

External appearances. Marasmus in its last stage; nothing else unusual.

Head. Subarachnoid tissue of the convex surface of the brain infiltrated with a moderate quantity of serosity; a tablespoonful of the same fluid in each lateral ventricle and at the base of the cranium. Septum lucidum softened and pulpy inferiorly; encephalon otherwise sound.

Neck. Epiglottis and larynx natural; mucous membrane of the trachea of a delicate red hue, studded inferiorly with ulcerations in some number, the largest of which were next the fleshy portion of the organ.

Chest. Left lung very closely adherent to the costal pleura

at the apex; elsewhere attached by cellular filaments containing a little effused serosity between them. The upper lobe was hard and transformed into a semi-transparent gray matter, in the midst of which appeared another substance, of perfectly homogeneous aspect, and yellowish colour, resembling jelly on first sight, but in reality much firmer and resisting some amount of pressure. Here and there were seen some softened tubercles, in course of evacuation; and at the apex a cavity (capable of containing a moderate-sized apple) filled with a firm mass of fibrin, of red colour, itself invested with a false membrane scarcely adhering to that of the cavity, white, rather fragile, and giving off several septa, converging to and uniting at a central point. Around the cavity and in the midst of the gray substance were vessels of half a line [1 millimeter], or somewhat less, in diameter. I traced them easily with a fine probe, but could not discover any communication between them and the cavity. A sort of septum, separating this cavity from another of much smaller size behind it, likewise contained a small vascular ramification, not opening into either excavation. In the lower lobe, half of which was still permeable to the air, were gray matter, tubercles, and granulations in abundance.—On the right side there were cellular adhesions over the entire surface of the lung; at the apex numerous gray granulations and a cavity of moderate size,—at the base a few nodules of hepatized tissue.—Heart and aorta perfectly healthy.

Abdomen. Liver of dull red colour, deeper than natural; of usual size; bile of medium consistence.—Mucous membrane of the stomach villous, covered with viscid mucus, and of rather bright red colour over its entire extent; natural in respect of thickness and consistence.—Duodenum healthy.—Mucous membrane of the small intestine looks as if sprinkled with soot, otherwise quite healthy;—that of the large intestine somewhat softened and more or less red throughout its whole extent. There were four small ulcerations in the cæcum and ascending colon, their fundus formed of the adjacent cellular tissue, which exhibits a grayish colour, and is somewhat thickened. Fæces of dull yellow colour in the cæcum; elsewhere of light yellow colour and natural consistence.—The other abdominal viscera were healthy.

The fact of the apparent organization of the fibrinous coagulum, filling the large cavity in the left lung, would perhaps, if considered alone, justify us in referring its formation to the period of the copious hemoptysis mentioned in the patient's history; but the auscultatory signs and the symptoms observed at the close render such an opinion of extremely doubtful accuracy. In truth, when I saw the patient for the first time, eight days after hemoptysis had set in, I detected pectoriloquy under the left clavicle, that is, opposite the cavity which I afterwards found filled with the clot; this sign was also, be it observed, distinctly made out for several days consecutively, and yet twenty-four and forty-eight hours before death it was sought for in vain. On the hypothesis that the coagulation of the fibrin took place on some one of the last days of life, everything is readily explicable,—both the existence of pectoriloquy at the period of the patient's admission, and its absence at the close. On the converse hypothesis everything is inexplicable; while it involves as a consequence the existence and absence of pectoriloquy opposite a completely filled cavity. The sudden invasion of the other local symptoms—as the dyspnœa and the extraordinary sensation experienced behind the left clavicle four days before death—obviously renders it still more probable, notwithstanding the difficulty of accounting for these symptoms, that the formation of the clot took place on some one of the closing days of life.

With respect to the dyspnœa I may observe that the state of the mucous membrane of the stomach and colon, which it is fair to regard as the result of acute inflammation, must have in some measure contributed to its production.

I have very recently met with a still more remarkable case, of another kind, yet bearing upon the particular subject before us; the details are as follow:

Case III. A mantua-maker, aged 27, of rather delicate constitution, confined at the full period, without bad symptoms of any kind, fifteen days before, was admitted into the Hospital of La Charité on the 8th of March, 1825. She had coughed and expectorated for the last seven months and a half without any assignable cause, and occasionally suffered from pains in the sides. Rigors, followed by heat and perspiration, had super-

vened towards the close of pregnancy, and ceased after delivery. Total loss of appetite; considerable thirst for the last month; almost constant diarrhœa for three months. The patient had had no hemoptysis, and could not recall the time at which she began to lose flesh.

March 9th. *Present state.* Pallor of the entire body and lips; feeling of great weakness; she has difficulty in moving herself and scarcely stirs; lies with her head raised; oppression of breathing rather considerable; cough not frequent; a few mucous and partially opaque sputa. Percussion of chest clear over the entire surface; cavernous rhonchus in the right axilla and posteriorly on the same side between the shoulder and spine; lower down on the left side in the corresponding spot crepitant rhonchus in small quantity; elsewhere respiration natural; pulse small, weak, and frequent (110 in the minute); moderate heat of skin; tongue pale and clean; mouth clammy; total loss of appetite; no nausea; epigastrium and hypogastrium, especially the latter, the seat of pain, which is greatly increased by pressure. The patient had lost very little blood during and after delivery; on the fourth day afterwards the discharge had become whitish, and was now of the same colour, and very moderate in quantity.

Infusion of violets with syrup; gum potion; linseed enema; emollient fomentation of hypogastrium; half a julep; chicken-broth.

Until the 5th of April, the day of the patient's death, the thirst was moderate, greater by night than in the daytime; the sputa few in number, and only during the last twenty-four hours opaque and nummulated. On the night of the 25th of March she was attacked with rather sharp pain in the left side of the chest; it yielded promptly under the application of a few leeches; but thenceforth the cough and dyspnœa were very troublesome. Percussion and auscultation, repeated several times, invariably furnished the same results as on the first day.

The pulse continued small and weak, varying in frequency between 108 and 115 beats in the minute. She had an attack of violent rigors in the night of the 25th of March, and from that time a very obvious increase in the heat of the body generally was noticed. As far as I could ascertain, she never had perspirations.

No improvement took place in the appetite; after the 13th of March, nausea or vomiting either of green and bitter, or taste-

less and whitish, matters occasionally occurred, either during the fits of cough, or in the intervals between them. There was sometimes none of this vomiting for one or two days; while at other times it occurred repeatedly in the course of the same day. The abdominal pain became somewhat less violent; there was no diarrhœa till the last week, when it was copious, but not attended with colic. The urine began to scald in passing, and from the 28th of March to the 2d of April there was retention, requiring the frequent introduction of the catheter for its relief. On two different occasions the vaginal discharge temporarily assumed a red colour.

Some days after the patient's admission the feebleness had become less marked, and the face expressive of some animation. On the 12th of March I noticed slight œdema in the lower extremities; this rapidly increased. On the 25th pains in the thighs were complained of; two days before death these pains became extremely acute at the upper and inner part of the left thigh, just where a faint pinkish tint appeared in the skin. During the last night there was constant delirium with general agitation of the body; she died at 4 a.m.

Some additions were made to the first prescription at subsequent periods; she had infusion of triticum repens sweetened with syrup of the five roots for her ordinary drink; and aromatic fumigations with juniper berries were employed. During the continuance of the diarrhœa the white decoction with syrup of quinces, diascordium with three quarters of a grain [5 centigrammes] of opium, and, lastly, a small opiate enema, were prescribed. Chicken-broth was the only nourishment allowed.

Sectio Cadaveris; *twenty-eight hours after death.*

External appearances. Considerable serous infiltration of the lower extremities; a few phlyctenæ at upper and inner parts of the thighs, and some redness of the skin in the same places.—The femoral veins, especially those of the left side, were distended with fibrinous clots of firm consistence, and red colour of various degrees of depth, strongly adherent to their parietes. The lining membrane of the veins, tinged of a delicate pink hue, was somewhat thicker than that of a subject of the same age, examined for the purpose of ascertaining the point. The coagula extended into the collateral and iliac veins, as far as the superior cava.

Head. Clear-coloured serous infiltration under the arachnoid investing the convex surface of the brain; somewhat less than a tablespoonful of similar fluid in each lateral ventricle; a tablespoonful and a half in the inferior occipital fossæ. Entire encephalon somewhat soft.

Neck. One of the lymphatic glands on the left side was enlarged to the size of an almond in its husk, unnaturally hard, reddish, and studded with several yellowish and opaque spots, evidently of tuberculous character. Epiglottis, larynx, and trachea natural.

Chest. About three pints and a half of transparent reddish serosity in the *left* pleural cavity; the lung reduced to a very small bulk and covered, like the costal pleura, with a red coloured and tolerably firm false membrane, less than half a line [less than 1 millimeter] thick. The tissue of the organ was of grayish colour and healthy, but contained no air; the bronchi, of bright red colour, had not undergone any notable thickening. —A few cellular adhesions on the *right* side; at the apex of the lung a cavity of medium size, partly filled with a turbid greenish fluid, in the midst of which appeared a body of slightly grayish colour, streaked, like the pulmonary tissue, with black lines, of oblong form, somewhat flattened, measuring one inch and four lines [32 millimeters] in length by ten lines [20 millimeters] in breadth, light, soft, somewhat elastic, exhibiting a very slight rosy tint in its interior; and, in a word, perfectly similar in all its properties to a fragment of lung of equal dimensions, that had been lying in water for some time. It was without any disagreeable smell, and presented no peduncle on its surface. The cavity was lined with a false membrane of tolerable consistence, about a quarter of a line [half a millimeter] thick, and resting upon sound pulmonary tissue; on the surface of the membrane, at two points opposite each other, appeared projections of about one line [2 millimeters] in elevation, and formed of the extremities of two bronchial ramifications. The remainder of the organ was slightly engorged, but free from tubercle, gray granulations, and indeed a trace even of any other organic lesion. The bronchi were pale and thin,—heart scarcely two thirds of its natural size; aorta healthy.

Abdomen. About a pint and three quarters [1 litre] of lemon-coloured transparent serosity in the cavity of the abdo-

men. The stomach, almost twice as large as natural, filled a part of the left hypochondrium and reached as low down as the umbilicus; its mucous membrane, of yellowish brown colour throughout its entire extent, with the exception of a zone about one inch and two lines [3 centimeters] wide, close to the pylorus, presented a moderate amount of consistence, but had lost half its natural thickness. The thickness of the membrane was even still less opposite certain whitish spots, of rounded form, from about one line to one and a half [2 to 3 millimeters] broad, and pretty uniformly distributed in large number over the entire surface. The mucous membrane of the small intestines was in the natural state; that of the cæcum and ascending colon somewhat softened; while in the remainder of the last intestine it was as soft as mucus, but red only in the rectum; there were no ulcerations.—Mesenteric and mesocolic glands healthy.—Uterus almost double the natural size; its cavity dilated; its internal surface blackish; its tissue more or less red, spongy and fragile; its walls were not thickened, except anteriorly, where they protruded inwards about one line [2 millimeters]. Ovaries somewhat softer and larger than natural.—The other abdominal viscera sound.

The presence of a fragment of pulmonary tissue in the interior of a cavity is without doubt a very extraordinary circumstance, and one which perhaps had not previously been observed. No question can be entertained, nevertheless, of the real nature of the substance described; for in respect of colour, consistence, structure, and fracture, it in nowise differed from pulmonary tissue. The deficiency of putrid smell shows that its complete separation from its attachments had not long been effected; and it is presumable that, for some time previous to its separation, it had adhered to the rest of the organ merely by the two prominent portions of bronchi above mentioned. Here, in fact, were the only points of the parietes of the cavity uncovered with false membrane; elsewhere this membrane exhibited the same structural characters in every direction; a fact indicating, no doubt, that the separation of the mass had been some time accomplished in every place except the two spots in question.

There was another remarkable peculiarity in this cavity; I mean the circumstance of its lining membrane being in imme-

diate contact with healthy pulmonary tissue, or, if not actually healthy, simply congested to a slight amount; this is, in truth, extremely rare.

But might it not be considered that some motive exists for inquiring whether this cavity was really tuberculous, or the patient really phthisical? Might it not be urged that there were neither tubercles nor gray granulations in the lungs, nor ulcerations in the larynx, trachea, or intestines,—morbid states of such common occurrence in phthisis? True; but, on the other hand, the purulent matter in the cavity was perfectly similar to that usually found in tuberculous excavations, its lining membrane differed in no respect from those observed in the latter; and, lastly, one of the cervical glands was partially tuberculous: this last argument is perhaps one of the most conclusive; for, as we shall hereafter see, I have never observed tuberculous transformation of the lymphatic glands except in phthisical subjects.

Among the circumstances of this case which deserve to be briefly recalled are, the attack of pleurisy, occurring on the left side, and accompanied by sharp pain at its invasion; the partial and general attenuation of the mucous membrane of the stomach, unassociated with notable softening; the altered colour of the uterus resulting from inflammation; and the œdema of the lower extremities evidently referrible to the obstruction of the femoral veins.

I shall conclude the remarks it was my intention to make upon the subject of tuberculous cavities, by observing that I have not in a single instance discovered in the midst of *healthy* pulmonary tissue, cavities (communicating with the bronchi) lined, like *old-existing* tuberculous excavations, with a false membrane of slightly grayish colour and opaque semi-cartilaginous appearance. Nevertheless, such cavities have been observed by Laennec, and subsequently by several other investigators, in the bodies of persons who had, during periods of variable duration, laboured under the symptoms of phthisis; and on the evidence of their structure it would appear difficult to avoid regarding them as consequences of softening of tubercles, and viewing their formation as a mode of cure of this morbid product. The preceding case is well calculated to support this view; for here, as in the instances referred to, supplied by the experience of

other observers, the cavity was single and the pulmonary tissue healthy; and it is presumable that if the patient had survived a few weeks or months longer, the pseudo-membrane lining the cavity would have assumed the characters just mentioned.

Nor have I succeeded in finding at the apices of the lungs those masses of condensed cellular membrane, with dilated bronchial ramifications terminating in them, which Laennec regards as cicatrices of tuberculous cavities. Still I am far from denying the real existence of this anatomical state, observed as it has been also by some of Laennec's successors, or from questioning the fairness of the induction which that illustrious physician drew from it. And, as has been remarked by M. Andral, if it be true that we sometimes discover at the apices of lungs, which exhibit the reliquiæ of chronic inflammation *without tubercles*, nodules and septa of cellulo-fibrous, fibrous, and cartilaginous character, such as are found in tuberculous subjects, these conditions differ from the analogous ones observed in phthisical patients, in that no bronchial ramifications terminate, and are lost, in the mass of adventitious tissue. M. Andral, in truth, justly states, that when the latter peculiarity is wanting, the pathological signification of the appearance cannot be the same as when it is present; there is no longer any motive for considering that the solid nodule fills the place of a preexisting cavity, and it may under these circumstances be fairly regarded as having been formed *primitively*, like tubercle or melanosis. I may add that these remarks of M. Andral, simple and just as they are, have not been always taken into consideration by observers.

Not only do gray semi-transparent granulations undergo transformation into tubercles; not only do these soften after a variable time, and give place to cavities, which in some cases remain empty and contract, in others become filled with a white fibrous or semi-cartilaginous substance; but in certain cases (to be fully consdered in connexion with the subject of the progress of phthisis) tubercles present a mixture of tuberculous matter, properly so called, and of cretaceous matter. The latter predominates in the mass in many cases, is the only substance present in others, and always appears at the apex of the lung, in the situation where the development of tubercles originates. It would even appear, from the interesting inquiries

of M. Papavoine[1] that in persons of adult, and more especially of advanced, age, granulations of considerable size and cartilaginous aspect are sometimes found containing osseous particles; as though the gray semi-transparent granulation were capable of undergoing the latter transformation, without previously passing through the tuberculous stage, properly so called.

The depressions observed at the upper part of the lungs, accompanied with puckering of the pulmonary tissue surrounding them, have not appeared to me to be connected with any determinate form of disease. I have frequently seen them when the pulmonary tissue was either healthy, or simply a little indurated in the immediate vicinity of the pleura,—or, on the other hand, when the upper lobe presented at its apex softened tubercles, small tuberculous excavations, or osseous concretions.

I have never met with *bronchial ramifications* in the interior of tuberculous cavities, or of masses of gray semi-transparent matter; whence the apparent inference that the first effect of the development of this matter is, as had already been remarked by Laennec, the destruction of the bronchi in the part where it occurs. It might be imagined that this destruction is accomplished by the transformation of the bronchi into gray or tuberculous matter; but this appears to me extremely doubtful, inasmuch as I have never observed this transformation either in the neighbourhood of cavities or tuberculous masses, or in any part of the lungs, even where the bronchi exhibited some other kind of morbid change. The probability then is, that the destruction in question is effected by absorption.

However, in an interesting essay by M. de Castelneau on Metallic Tinkling,[2] there is a circumstance mentioned which appears to constitute an exception to the general law just referred to. The writer, while describing certain columnar bands crossing a large cavity, many of them supplied with perfectly permeable vessels, states as follows :—"The bronchi form only a very small number of the columnar bands; the majority of those tubes are cut across, and open into the interior of the cavity. This is rendered matter of certainty by pouring water into the trachea; for the fluid oozes into the cavities through

[1] Journal des progrès des Sciences médicales. 1830. t. xx, p. 90.
[2] Arch. gén. de Méd., Oct. 1841. pp. 247, 248.

several orifices. Two only of the bronchi open below the softened tuberculous matter, wherewith the cavern is partially filled."

The mucous membrane of the bronchi had in some cases retained its natural whiteness in the vicinity of tuberculous cavities; but in the majority was of a bright red colour. This red discoloration apparently arose from the frequently repeated passage of the purulent contents of the communicating cavities; for it was not observed at all, or at least rarely observed, in the neighbourhood of masses of gray matter or non-softened tubercles;—it was less frequent in ramifications opening into recently formed cavities than in those communicating with excavations of long standing;—and, when general, it was more strongly marked close to the latter than in any other situation.

When red, the bronchial mucous membrane was in some cases slightly thickened, in others the seat of small ulcerations, or, as was much more common, the bronchi were dilated and the tissues composing them thickened. This thickening was more especially marked at the apices of the lungs, where the tubes were frequently three and four times thicker than natural. These various structural changes must, as it is readily conceivable, materially increase the danger of the original malady.

Except in a single case (that of a patient observed, at the Hospital of La Pitié, since the publication of the first edition of this work) I have never met with tuberculous pseudo-membrane on the mucous membrane of the bronchi. The patient was a young man, aged eighteen, of middle height, and well-developed muscular system; respecting his commemorative history I was unable to obtain any very precise information, as he was seized with symptoms of meningitis on the day after his admission. The lungs contained tubercles in tolerable abundance, but no cavities; and in the upper lobe, on the left side, one of the bronchi presented in its interior, close to its origin, a tuberculous pseudo-membrane, extending entirely round the tube, and measuring an inch in length. It reappeared about an inch lower down, and thence extended onwards with exactly the same appearance as before, to the surface of the lung. It was less than half a line [less than 1 millimeter] thick, and easily separable from the subjacent mucous membrane, which had retained its natural whiteness, thickness, and consistence.

Compression of the bronchi by tubercles developed at the root of the lungs is a phenomenon of which I have myself witnessed no example; nor have contemporary observers been more fortunate. Still the occurrence can be easily conceived; the more so as M. Reynaud, in his 'Essay on Phthisis in the Quadrumana,' actually narrates a remarkable example (Case VIII) of the kind, observed in one of those animals. In this case a globular mass of bronchial glands, completely converted into tuberculous matter, surrounded the left bronchus, and flattened the tube to such an amount as to obliterate its cavity altogether, and render it difficult to force the blade of a small scalpel through the contracted part;—this part measured about half an inch [12 millimeters] in length: further on, the caliber of the tube became natural. The corresponding side of the chest was remarkably contracted, and the left lung completely collapsed and free from air,—in the precise state, in short, in which it is found in cases of compression of the organ by chronic pleuritic effusion. But there was no liquid present; the pleura was perfectly healthy and free from adhesions.

Were a case of this kind to present itself in the human subject, its nature would almost inevitably be mistaken, unless the patient were observed while the compression of the bronchus was still recent, and unless the observer could follow the progressive diminution in the force of respiration and the equally gradual decrease in the bulk of the thorax. These conditions would, however, point to the real nature of the case; for where diminution in the size of the chest coadvances with diminution in intensity of the respiratory murmur, the idea of pleurisy could not be entertained, inasmuch as this would be accompanied by symptoms following an opposite course. It would then be scarcely possible to do otherwise than suspect the existence of a tumour of some kind or other pressing upon the bronchi.

Since the publication of the first edition of this work, the morbid anatomy of the tuberculized lung has made unquestionable progress, more particularly in respect of its vascular system. It was, no doubt, well known fifteen years past, that the ramifications of the pulmonary artery penetrate neither into tubercles properly so called, nor into gray semi-transparent granulations; but our knowledge on this subject has since then advanced.

It is, in truth, now established by the inquiries of M. Schroeder van der Kolk, and more especially those of M. Natalis Guillot,[1] that the branches of the pulmonary artery stop short at a certain distance, one and a half, two, or two and a half lines [3, 4, or 5 millimeters], from tubercles or gray granulations; and the more these adventitious productions increase in size, the further from their perimeter do the divisions of the artery cease to be discoverable. To such a degree is this true, that when tubercles are of large size, or have given place to cavities, they may be surrounded by a sort of involucrum, upwards of nine lines [2 centimeters] broad, into which no ramification of the pulmonary artery makes its way. M. N. Guillot's injections appear to me to render doubt upon this point inadmissible.

The injections, dissections, and microscopical examinations of this observer likewise show that, during a space of time which is always very limited, the sort of involucrum in question exhibits no trace of vascularity; at the end of that period a few red streaks with tapering extremities are perceived,—the largest of them measuring as much as half a line [1 millimeter] in diameter. These vessels, which are for a certain time perfectly unconnected with the rest of the vascular system, and consequently not the seat of apparent circulation, soon enter into communication with the bronchial arteries or with those supplying the thoracic parietes. The connexion with these latter vessels is effected by means of the pseudo-membranes, so common on the pleural surfaces,—pseudo-membranes, themselves the seat of development of vessels, isolated at first, like those of the involucrum surrounding the tubercles, but eventually inosculating with the neighbouring arteries and the vessels of new formation.

The seat of these vessels is at first, as has been stated, the interspace between the ultimate ramifications of the pulmonary artery and the periphery of the tubercles; but, in proportion as the latter multiply, enlarge, and soften, the vascular rete spreads in every spot where it has appeared, and ere long an entire lobe, oftentimes a large portion even of the lung, is the seat of this adventitious vascular system, replacing the pulmonary artery, the existence of which vessel ceases to be a demonstrable fact. Thus is accomplished, to use the expression of M. Guillot, the great transformation of the circulation, one of

[1] L'Expérience, t. i, p. 545.

the most remarkable phenomena attending the evolution of phthisis.

The vessels of new formation, which at a certain period of the disease become incalculably numerous, stop short, according to M. Guillot's observations, around tubercles, without penetrating into their substance; the case is somewhat different in respect of cavities. In fact, they extend into the prominences on the surface of these, and ramify abundantly in, and impress colour upon, the bands, so frequently stretched from one point to another of their parietes. And if a portion of cavity be placed under water, after all mucous and purulent matter has been separated from its surface, this surface is seen studded with tufts of new vessels, which, taken together, represent a sort of villous structure, when observed with a common lens. Hence, observes the author, it is not only the highly vascular web surrounding cavities, with its new circulation, that constitutes a striking feature in the anatomy of those excavations,—but, further, the terminal tufts which bring the arterial blood, derived from the aortic circulation, into contact with the atmospheric air.

The question next naturally arises, how the aortic blood, thus distributed through tuberculous lungs, returns to the heart. The fact ascertained by M. Guillot that the substance of injections thrown into the aorta is found in the pulmonary, bronchial, and azygos veins, supplies a satisfactory answer to the query.

He observes that among the effects of this double current, there must arise a change in the nature of the blood of phthisical subjects and a special modification of the organism generally,—that in proportion as the tuberculous affection makes progress, so do the lungs, in direct opposition to ordinary laws, acquire increased capacity for arterial blood and lose it for venous.

It may now be inquired, in which of the various systems of organs composing the lungs does the development of tubercles take place. It results from the researches of M. N. Guillot that the ramifications of the pulmonary artery, as far as they can be traced, are smooth and free from tubercle; so that the opinion of those who place the primitive seat of the product in the vessels is with difficulty tenable. On the other hand, according to the same observer, if the bronchial ramifications of a tuberculous lung be cut open as far as possible, (the organ

having been previously injected in such manner that the fluid used shall have filled the entire web formed by the bronchial arteries on the surface of the tubes,) morbid changes are invariably detected in these. The earliest stage of change appears in the form of a small whitish speck, produced by a semi-transparent matter, of rounded or elongated shape, and resembling the miliary tubercle pretty closely in colour and consistence, or still more closely a small fragment of epidermis macerated in water; at this period no vascularity is discoverable in the subjacent mucous membrane. In the second stage the whitish semi-transparent matter is thicker and more spread out, and the corresponding part of the parietes of the bronchial tube is destroyed within variable limits. Hence it follows that the production of tubercles does not take place in the pulmonary vessels, but in the bronchi,—a doctrine which, as is well known, is that professed by Dr. Carswell. It is true, adds M. Guillot, that at the period when the morbid matter may be made the subject of examination in the bronchi, there have already long existed tubercles in the midst of parts of the organ inaccessible by means of instruments; but is it not fair to presume that the phenomena of which I have just spoken may have equally well taken place in the ultimate saccular terminations of the respiratory tubes? It is, however, a matter of very little consequence, whether the primitive seat of a tubercle placed in the centre of the lungs be the internal surface of a pulmonary vesicle, or the substance of the wall separating each pair of cells; the extreme tenuity of these parts is well known, and the attempt to assign a special localization to any morbid change, at the period of its origin, in the midst of such excessively delicate parts, could really lead to no useful result.

I may observe too, for my own part, that tubercles and the gray granulations in which they originate, may be, and actually are, developed, as we shall hereafter see, in all organs;—a fact proving that their evolution does not require the presence of any particular description of tissue. And hence, even while we admit as established the presence of rudimentary granulations in the terminal bronchial ramifications or in the air-cells, we cannot conclude that these are the exclusive seats of tubercle in the lungs.

Certain objections, emanating from observers of distinguished eminence, have been urged against the notion I have

laid down, that the gray semi-transparent granulation is the first stage of tubercle. These objections deserve examination.[1]

M. Andral thinks that tubercle is formed of a drop of pus, or at least of a fluid having the aspect of pus; and that this drop, at first totally without consistence, subsequently becomes firm and finally assumes the characters of tubercle. But it is to be remarked that he has only observed this series of phenomena in lobules affected with pneumonia or œdema; and I have in vain, even quite recently, sought for them in tuberculous subjects, although my search was most carefully pursued. It is in vain to object to M. Andral that the gray semi-transparent granulation constantly precedes the development of the true tubercle; he replies by referring to certain granulations described by Bayle, which are apparently of cartilaginous nature, never become opaque, and do not soften. But in turn I may remind the celebrated Professor that Laennec has actually seen these granulations transformed into yellow opaque tubercles;—that Bayle himself remarked an opaque white spot in them;—that the time requisite for the transformation of these granulations into tubercles is subject to extreme variety;—that I have never seen gray granulations in any numbers without some of them being tuberculous in the centre, and that I have never under these circumstances detected isolated drops of pus. Another argument used by M. Andral is, that the gray granulation is not proper to tubercle, because it is not discovered in several organs where the latter forms; this argument is at the present day altogether without force, probably even in M. Andral's own opinion, for gray granulations have been found in all the organs, even in the bones themselves.[2]

Nor do the experiments, whereby MM. Lallemand and Cruveilhier have sought to prove tubercle to be nothing more than concrete pus, appear to me more conclusive. The facts just enumerated in refutation of M. Andral's opinion are perfectly applicable here also. Further, the abscesses produced by M. Cruveilhier by introducing globules of mercury into the lungs, do not resemble tubercles; and M. Lallemand, in giving

[1] See the important Essay of M. Valleix, (Arch. gén. de Méd. 3ème série, Fevrier et Mars 1841,) from which source I have derived what follows relative to this subject.

[2] M. Nélaton, Thèse sur l'Affection Tuberculeuse des Os. Paris, 1836.

tubercle the outward appearance of pus by mixing it with water, has simply shown that different materials may by certain processes be made to acquire a certain amount of resemblance. Those who regard the secondary, "multiple," or "metastatic" abscesses of the lungs as affording proof of the inflammatory origin of tubercle, forget that these abscesses never exhibit themselves under the form of gray semi-transparent granulations, and that the concrete appearance of the pus arises from its being infiltrated through the pulmonary tissue. Lastly, pus and tuberculous matter present very different characters under the microscope, according to the observations of Dr. Lebert.

Other observers have described a granulation (very different from the gray semi-transparent variety) which they believe to be the earliest rudiment of tubercle. Thus, according to MM. Rochoux,[1] Desmazzone, and Meriadec Laennec, the miliary tubercle described by Laennec is not the first, but the second stage of the disease. The first they consider constituted by a minute body, of the size of a millet-seed, of reddish colour, glossy, tolerably firm, resisting pressure, giving out no liquid when flattened between the nails, and adhering to the pulmonary substance by a great number of vascular filaments. M. C. Baron[2] has made similar observations; he has seen red spots, which on first sight appeared the result of infiltration of blood, subsequently give place to the transparent granulation,—and from this he draws the conclusion, that tubercle is nothing more than blood, extravasated from the minute vessels, which undergoes various transformations.

Without having the slightest intention of throwing doubt upon the accuracy of the facts collected by M. C. Baron, I may yet be permitted to believe that the infiltration of blood observed by him was accidental. For, on the one hand, I have never, in spite of very careful scrutiny, seen anything of the kind in lungs affected either with tubercle or any other species of morbid change; and, on the other, the microscopical researches of MM. Schroeder van der Kolk, Carswell, and Guillot have placed the existence of the gray semi-transparent granulation in perfectly rudimentary tubercles beyond all reasonable doubt.

I do not think it necessary to submit to consideration the

[1] Valleix, loc. cit.

[2] Arch. gén de Méd. t. vi, 1839.

opinion of those who regard tubercles as transformed hydatids; and I shall conclude this subject by one general remark upon the various theories just referred to. It is, that the majority of these theories would not have been promulgated by their authors, had they not, in instituting inquiries into the origin of a product which forms in *all the organs*, almost invariably limited their researches to the *lungs*, and had they not failed to repeat the same observations a sufficient number of times. I cannot refrain from adding, so deeply am I convinced of the truth of what I advance, that had recourse been had to numerical analysis—that method which, while it forces us to count our facts, obliges us likewise to examine them under a multitude of different aspects—all these dissentient opinions could not have been entertained.

Inflammation of the pulmonary parenchyma was not of rare occurrence. I found it in the second stage, and affecting a variable extent of lung in eighteen subjects, somewhat less than one sixth of the whole number. The pulmonary tissue affected was red, deficient in air, hard and granular,—in a word, hepatized; the hepatization almost always occupied the lower lobe. In nine cases its extent was very considerable, the disease implicating in these instances one half or three quarters of one lung; in the remainder it was limited to a much smaller space, and presented itself under the form of small disseminated nodules. In four of the first category of subjects there were very large tuberculous cavities; in the others only semi-transparent granulations, or the remains of tubercles partially evacuated.

The characters of the anatomical change pointed to the recent origin of the disease, and the history of the symptoms showed that its invasion had preceded death by only a few days.

"Engorgement," or the first stage of pneumonia, commonly occupying a limited space, existed in twenty-three cases. In four instances only did this morbid condition pervade the greater part of one or of both lungs. Wherever thus affected, the pulmonary tissue was but slightly crepitant, gave out a great deal of red spumous fluid on incision, and was much diminished in consistence and easily torn.

In one of these cases of extensive "engorgement" pain was

complained of two days before death, followed by crepitation of variable fineness on the affected side. These symptoms, while they depose to the inflammatory character of the anatomical change, show that here too, as in the cases of hepatization, the inflammation did not set in until the closing days of life.

The development of pneumonia so near the close of life, is however, not peculiar to phthisical subjects; I have observed it holding the same relationship to other chronic diseases, and this with very much the same proportional frequency. Of one hundred and twelve subjects dying in the most advanced stages of these affections, twelve exhibited, on examination, a red, granular, hepatized state of one or both lungs. "Engorgement" existed in two other cases; and in these, as in the phthisical class, the course of the symptoms proved the inflammation to have been a phenomenon of the closing days of life.

Now it results from this comparison of the two great categories of chronic diseases—phthisical and non-phthisical—that tubercles and tuberculous cavities have little or no influence on the development of pneumonia during the *last* or *terminal* period of phthisis.

SECTION II.—PLEURÆ.

No anatomical change was so common as *adhesions* between the lungs and costal pleuræ; to such a degree, that among one hundred and twelve subjects, I found but one whose lungs were perfectly free in every point of their surface. In eight cases only did I find the right lung wholly unattacked, in seven the left; in these cases there were either no cavities in the non-adherent lung, or, if any, they were very small.

In twenty-five other cases the adhesions were cellular, easily torn, limited to a small surface, and very generally to one side of the chest. In seven of these twenty-five cases there was no cavity in the adherent lung; in ten others the cavities were but small; in the remaining eight either of medium dimensions or very large.

In the other individuals, whose bodies I examined, the pleuritic adhesions were either general or of very considerable extent, and composed either of cellular tissue, more or less dense,

or of pseudo-membrane; under these circumstances cavities of large dimensions were almost invariably found.

The abundance of adhesions and the amount of internal disorganization consequently bore a direct proportion to each other. If there were no adhesions, neither were there large or medium-sized excavations,—generally speaking, indeed, there were none of any kind. When the adhesions were easily torn and limited in extent, the cavities had commonly attained but very small size; in rare instances only had they acquired large dimensions, and in some cases no excavation of the substance of the lung had occurred at all. Lastly, when the adhesions were close and spread over a considerable part or the entire surface of the lung, there were invariably cavities present; and these, in the great majority of cases, were of large or medium dimensions.

The relationship subsisting between the size of the tuberculous cavities and the pleural adhesions, points to the influence of the former on the generation of the latter. The cavities, when of large size, were always seated at the apices of the lungs, close to the surface, and here only were found those thick, firm membranes, already mentioned, which strengthened the walls of adjacent cavities and sometimes actually formed them in part. There are other facts, too, which appear demonstrative of the influence in question. Thus in two subjects whose lungs contained only two masses of tuberculous matter, seated immediately under the pleura, there were no adhesions except in the corresponding points, and these adhesions, cellular in structure, measured nearly one inch and seven lines [4 centimeters] in length, and equalled the adventitious masses in breadth.

These adhesions were the result of chronic inflammation: and, as will be seen hereafter, the history of the patients' symptoms rendered the period of its invasion, in many cases, satisfactorily determinable.

Since the publication of the former edition of this work I have met with additional cases of the same kind. Since that time also I have seen tubercles or gray semi-transparent granulations developed on the attached surface of the costal pleura, attended, or not, with formation of pseudo-membrane on the corresponding free surface; and, as will be shown in the chapter devoted to the subject of the Peritoneum, such cases are not of such rare occurrence as might be inferred from the silence of other authors,

as well as of myself, upon the matter. I have in two instances found pseudo-membrane of moderate consistence, and covering the costal and pulmonary pleuræ, converted into tuberculous matter. (Case XXIV.) In a third instance I discovered tuberculous transformation of a very limited portion of a semi-cartilaginous pseudo-membrane, investing the apex of one of the lungs.

Pleurisy, as well as pneumonia, occurred in a considerable number of subjects at the close of life, when debility and emaciation had reached their maximum. I observed it in one tenth of my cases. The lung or costal pleura, generally both of them, were covered, to a variable extent, by a false membrane of yellowish colour, soft consistence, and varying thickness; with this coexisted effusion of a certain quantity of reddish serosity, either transparent or turbid;—in some cases the fluid was actually purulent. The anatomical characters of the affection showed its recent origin; and the symptoms fixed its invasion to nineteen, twelve, eight, and three days before death.

I have also observed *pleuritic effusion*, consisting of *transparent serosity*, to the amount of about a pint and three quarters [1 litre] and upwards. This effusion noticed in one tenth part of my cases, occurred in some of them with great rapidity. Thus in two patients whose chests emitted a perfectly clear sound on percussion from the base to the apex a day and a half before death, there were about three pints and a half [2 litres] of limpid serosity discovered in one pleural cavity.

With two very remarkable exceptions the various morbid states just passed in review occur, though in different proportions, in subjects carried off by other chronic diseases as well as by phthisis. Thus in thirty-five out of one hundred and ten cases in which I looked for them, adhesions were discovered; and in twelve of these the adhesions were general, either on both sides or on one only. Although this proportion is high, still it falls much below that ascertained in the instance of phthisical patients; a circumstance furnishing new evidence of the influence of tubercles on the development of adhesions.

Pleurisy frequently occurs at the close of non-tuberculous chronic diseases, in the same manner as in phthisis. Sometimes

the attack may be referred to obvious causes, as the application of slight cold to the surface; more generally no cause can be discovered. The affection follows a rapid course and hastens the fatal issue of the original malady; a fact demonstrating the necessity of close attention to patients in the advanced stage of chronic diseases, and of protecting them from the influence of all external causes capable of engendering inflammation of the lung or pleura.

Effusion of transparent serosity into the pleura is among the observed terminal phenomena of other chronic diseases. I found such effusion in one fourth of my cases, exclusive of those of cardiac disease; and this high proportion, corresponding as it does to that pointed out in respect of adhesions in phthisis and in other organic affections, appears to show that this species of hydrothorax cannot be considered dependent upon the nature of the primary malady.

The two morbid states of the pleura which appear proper to phthisis are, on the one hand, the cartilaginous cap investing the apex of the lung, when extensively excavated; and on the other, the tubercles sometimes met with either in pleuritic pseudo-membranes or under the attached surface of the serous tissue: at least, I have for my own part met with these appearances in phthisical subjects alone.[1]

SECTION III.—EPIGLOTTIS, LARYNX, AND TRACHEA.

Of these three organs, which constitute part of the same system, and are strongly analogous in respect of structure and susceptible of the same morbid changes, the larynx has alone attracted the attention of observers of phthisis. The ulcerations of which it becomes the seat have been described, but those of the epiglottis have been passed over in silence, and scarcely has the existence of tracheal ulcers been alluded to. The reason

[1] M. Andral (Clin. Méd. t. iv, p. 243, éd. 4,) states that in almost all cases, where he has observed tubercles in the pleuræ, he has discovered those bodies in the lungs also,—a mode of expression which would appear to indicate that M. Andral has met with some exceptions to the general law I have myself deduced from observed facts. However, M. Andral gives us no information respecting the precise signification of the word *almost*; we are consequently justified in believing that the entire statement is made from memory, and not from direct analysis of recorded cases.

of these omissions is doubtless none other than the absence, oftentimes complete, of symptoms significative of these lesions, coupled with the too common neglect, on the part of the physician, to examine any organs after death except those having given evidence of functional disturbance during life. Be this as it may, ulcerations of the epiglottis are not of rare occurrence in phthisis,—they are indeed almost as frequent as those of the larynx; for in one hundred and two cases in which the parts were carefully examined, epiglottic, laryngeal, and tracheal ulcerations stood to each other in the proportions of 18, 22, and 31.

§ 1. *Ulcerations of the Trachea.*

When the seat of ulceration, the mucous membrane of the trachea was commonly of bright red colour. In some cases, nevertheless, more especially where the number of ulcerations was small, it retained its natural whiteness,—a peculiarity noticed in six out of thirty-one cases, in one of which, indeed, the ulcerations were very extensive. (Case XXIV.) Redness of surface was most marked in the lower half of the trachea, where the ulcerations were remarkable for their size and number. In about one fifth of the cases slight thickening and softening of the mucous membrane coexisted with this redness.

When small the ulcerations were generally uniformly distributed over the entire circumference of the trachea; they exhibited a rounded or oval form, and measured about one line [2 millimeters] in diameter. Destruction of the mucous membrane left them a fundus of cellular tissue, slightly or not at all thickened: they had flat edges, and consequently looked as if cut out with a punch. It is conceivable that these ulcerations should often escape notice on account of the flattening of their edges and their pinkish colour, unless due precautions were taken by washing the trachea and conducting the examination with much care.

When of greater size, they were unequally distributed; and the largest among them congregated together at the fleshy portion of the trachea. Just as in the case of the small-sized ulcerations the mucous membrane surrounding those now under consideration, retained the same thickness, colour, and

consistence as in the greater part of its extent: the submucous tunic indurated and thickened, formed their fundus; or in some cases even this was destroyed and the muscular coat laid bare. (Cases XXIII, XXIV.) This latter tissue, thus exposed, was two or three times thicker than natural, and in a small number of cases more or less deeply ulcerated. (Case XXIV.)

Some of the cartilaginous rings were occasionally completely denuded, attenuated, and partially destroyed, (Cases XXIII, XXIV;) or even actually completely cut through by the ulcerative process. This last condition of things I met with in one instance only, (Case XVI;) whereas I have five times (Cases XXIII, XXIV) observed total destruction of the mucous membrane of the trachea, extending the whole way, or nearly the whole way, from one end to the other of its fleshy part.

The greater frequency with which large-sized ulcerations exhibited themselves at the posterior aspect, than at other parts, of the trachea, is apparently ascribable to the constant passage of the sputa, and their more or less prolonged contact with that particular portion of the tube. For, if strongly stimulating fluids produce inflammation and subsequently ulceration of the mucous membrane of the stomach, the same effect must be produced in the trachea by the action of an excrementitious matter, possessed, no doubt, of very irritating properties. And it would be difficult to explain on any other principle than this the fact that ulcerations of the epiglottis are almost solely observed on its inferior surface—that most frequently touched by the sputa.

Still, while we admit that the matters expectorated exercise a real and notable influence upon the size and situation of tracheal ulcerations, it must likewise be acknowledged that there is some other cause for their production; for they are far from being always proportional to the acridity of the sputa, nor do they always exist when the pulmonary disease is extensive and the lung the seat of cavities of old standing.

In the third part of the cases in which the trachea was free from ulceration, its mucous membrance exhibited a red colour, increasing in intensity from above downwards. This discoloration was more marked than elsewhere opposite the fleshy part of the tube, a circumstance no doubt explicable in the same manner as the similar peculiarity of ulcerations just noticed.

§ 2. *Ulcerations of the Larynx.*

Ulcerations of the larynx were, as already indicated, somewhat less common than those of the trachea, rarely occurred where the latter were not present, and existed in the fourth part of my cases. In two instances only did I detect them, where the trachea was free from similar change. Their characters were in many cases very different from those of the tracheal ulceration; rarely superficial, or looking as if made with a punch, they were commonly of a certain depth, more or less irregular in outline, and covered a space varying from about one to ten lines [2 to 20 millimeters]: their edges, varying in amount of hardness, were sometimes lardaceous; their colour grayish or whitish. The mucous membrane exhibited elsewhere the characters of perfect health.

The point of junction of the chordæ vocales (where they were sometimes superficial) was the most common seat of these ulcerations; next in order of frequency came the chordæ vocales themselves, especially at their posterior aspect, the base of the arytenoid cartilages, the upper part of the larynx, and, lastly, the interior of the ventricles, where indeed I but once met with a small superficial ulceration.

Sometimes one or more of the chordæ vocales were totally destroyed and the base of the arytenoid cartilages laid bare. The cartilages themselves were, under these circumstances, perfectly sound.

§ 3. *Ulcerations of the Epiglottis.*

I found ulcerations of the epiglottis in eighteen subjects, or about the sixth part of my cases,—five times without coexisting ulceration of the larynx and trachea. This latter complication existed in the other cases; in such manner that all the examples of ulceration, enumerated under the present heads were furnished by forty-four cases, about four tenths of those now submitted to analysis.

Though sometimes superficial the ulcerations of the epiglottis were generally of a certain depth,—yet in two cases only did they reach the fibro-cartilage beneath. When superficial,

the mucous membrane in their neighbourhood did not appear manifestly thickened; when deep, on the contrary it was somewhat harder and thicker than in the natural state either immediately around them or in their interspaces. It was occasionally also of pinkish colour, and in several instances the tissue separating it from the fibro-cartilage more or less puffy.

The laryngeal surface of the organ was almost the exclusive seat of the ulcerations,—generally speaking too the lower half of that surface. I only once detected ulcerations on the lingual surface. (Case xx.) Their breadth varied from about one to about two lines [2 to 4 millimeters], or often more than this: in some cases indeed the mucous membrane has disappeared from the entire of the laryngeal surface, (Cases viii, xxii, xxiii;) in four cases some part of the edge of the fibro-cartilage was destroyed, as well as the surface ulcerated, so as to give the organ a festooned appearance. In a fifth case the epiglottis was totally destroyed. (Case xxi.)

I have not, in a single instance, met with tuberculous granulations in the substance, or on the surface, of the epiglottis, larynx, or trachea; so that inflammation must be regarded as the most frequent cause of the ulcerations of those parts.

Another circumstance worthy of note is that these ulcerations were of double as frequent occurrence in men as in women. Thus, though each sex furnished the same number of patients, the women only presented six examples of this condition of the epiglottis, seven of the larynx, and nine of the trachea, out of, respectively, eighteen, twenty-three, and thirty-one cases of the kinds, which fell under my notice; and as the proportional frequency is about the same for the three kinds of ulceration, the excess on the part of males is not, it is more than probable, the effect of chance.

The statements just made are corroborated by the examination of a tolerably large number of additional cases, which I have collected since the publication of the former edition of this work.

Of one hundred and ninety subjects, carefully examined, seventy-six, upwards of one third of the whole number, presented ulcerations in the *trachea;* eighty of these subjects, who were females, supplied twenty-one examples of ulceration,—

one hundred and ten men fifty-five examples of the kind; in other words, half the males and only about one quarter of the females were thus affected.

The *larynx* was closely examined in one hundred and ninety-three subjects, and was found in a state of ulceration sixty-three times, or in somewhat less than one third of the cases. Of the one hundred and ninety-three patients eighty were women, one hundred and thirteen men; among the former there were only nineteen cases of ulceration, or somewhat less than a fourth,—among the latter forty-four, or somewhat more than a third.

Of one hundred and thirty-five cases in which I find the *epiglottis* described, the organ was ulcerated in only thirty-five, or about one quarter of the whole number; of these one hundred and thirty-five subjects forty-seven were women and supplied eight cases of ulceration, eighty-seven were men and supplied twenty-seven cases of the kind; of the one sex a sixth only suffered, of the other nearly a third.

It results, then, from these additional cases, as from the former series, that ulcerations of the windpipe increase in frequency from the epiglottis downwards to the lungs, and that they are much more common in the male than the female; the precise proportion in the two sexes may no doubt vary, but the reality of the general law may be considered as perfectly established.

The influence of sex on the development of these ulcerations is further displayed by a series of cases which have very recently fallen under my notice. Out of nine cases of ulceration and destruction to a variable extent of the epiglottis, eight occurred in males; of thirteen cases of deep ulceration of the larynx two only were furnished by females; lastly, of nine patients affected with similar ulcerations of the trachea six were males, and in no instance was partial destruction of the rings of the trachea observed in a female.

I examined the *bronchi* of forty-nine phthisical subjects with extreme care, and found ulcerations in those tubes twenty-two times,—a still higher proportion than that noticed in the case of the trachea. Of these forty-nine subjects nineteen were women, five of whom presented the morbid change of texture in question; whereas seventeen of thirty men were thus affected, —an enormous difference, and one furnishing further evidence

of the dissimilar tendency in the two sexes to ulceration of the air-passages.

These cases of bronchial ulceration supply additional and decisive proof of the influence exercised by the sputa on the development of this whole class of ulcerations. Thus, their precise position in the bronchi was noted in twenty of the twenty-two cases, and in every single instance the ulcers were seated in bronchi communicating with cavities, and with the largest of them, when there were several; that is to say, that ulcerations only existed in those bronchi which had necessarily been in more or less prolonged contact with the matter contained in the cavities. A further reason for recognizing the reality of the agency in question appears in the fact, that ulcerations of the air-passages become less numerous the further those passages are examined from the bronchi or from cavities; for the matter of expectoration, of course, remains longer in contact with the mucous membrane close to its place of secretion than higher up the tubes. It is besides a well ascertained confirmative point, to the consideration of which I shall hereafter have occasion to return, that in phthisical cases those bronchi only, which communicate with, or are seated in the immediate neighbourhood of, cavities, exhibit signs of violent inflammation.

However, as I have already said, the irritation or inflammation due to the continual passage of the contents of cavities is not the sole cause of the ulcerations we have been examining; for, although rarely, these ulcerations do exist in cases where there are no cavities, and again they are not observed in cases where the mucous membrane of the bronchi and of the other parts of the air-passages is brought into contact with matter much better calculated to all appearance than any other to excite violent inflammation: I refer to cases of gangrene of the lung,—cases in which I have never observed such ulcerations, unless tubercles coexisted in the lungs.

Lastly, the additional cases, of which I have just exhibited the results, as these regard the subject before us, did not, any more than those formerly observed, furnish examples of the development of tubercles or gray semi-transparent granulations in the substance of the mucous membrane of the epiglottis, larynx, or trachea. And on the evidence of the large number of facts

from which this result has been derived, it may be regarded as a law of the system, that tubercles, so commonly and so abundantly developed in the lungs, are not produced, at least after the age of fifteen, in the upper air-passages: if such an occurrence does ever take place, it can only be regarded as a singularly rare exception to the ordinary course of things.

The proposition I have now laid down, is opposed to a statement made by M. Andral,[1] to the effect that the mucous membrane of the larynx is pretty frequently the seat of tubercles in phthisical subjects. Without by any means denying the reality of the alleged fact, attested as it is by so distinguished and so trustworthy an observer, I cannot help suggesting the possibility of some error having occurred, and doubting that the facts alluded to were always collected with sufficient care, and actually observed by himself; in truth, the commission of error is quite possible in this matter, and quite recently only I was invited to see certain laryngeal tubercles, which, upon examination, were not to be discovered. It is to be regretted, also, that M. Andral has not mentioned the proportional number of cases in which he has met with laryngeal tubercles; I do not remember to have read any particular case of the sort in his 'Clinique Médicale.'

It is more than doubtful that submucous tubercles of the air-passages are more frequent before than after the age of fifteen years, judging from the rarity of ulceration of those passages in very early life. However, M. Tonnelé, while he assures us that he never observed laryngeal phthisis in children, mentions his having found tuberculous productions in the cavity of the larynx in a boy aged fourteen,—these were two or three yellowish and slightly softened tubercles which had determined ulceration of the mucous membrane.

Upon an accurate analysis of the state of the epiglottis, larynx and trachea, in subjects who had fallen victims to other affections than phthisis,—and especially to affections belonging to the chronic class,—I found among one hundred and eighty individuals but one example of ulceration in the larynx, and two of the same morbid state coexisting in the larynx and trachea. In the first case the patient had died of pneumonia,

[1] Clinique Médicale, t. iv, p. 184. Paris, 1840.

and the lungs presented no trace of organic disease. In the two last death was caused by cancer and softening of the brain, there being at the same time tuberculous cavities in the lungs. Hence it follows that ulcerations of the larynx, more especially those of the trachea and epiglottis, must be regarded as proper to phthisis.

The cases I have collected within the last fifteen years corroborate in the most complete manner the truth of this law. In fact, among upwards of five hundred non-tuberculous subjects, carried off by chronic diseases, and examined by myself during that period, not one presented ulcerations in the larynx or trachea. However, among the cases quoted by MM. Trousseau and Belloc[1] appear five in which death is presumed to have arisen from an affection of the larynx, attended with ulceration of its investing mucous membrane, while the lungs were free from tubercles. But, as has already been remarked by M. Valleix,[2] the fifth of these cases (the ninth in the essay in question) quoted from a thesis by M. Sauvé, relates to an individual subject to colds, who had had at least one *considerable hemoptysis,* had lost flesh and suffered shortly before death from obstinate diarrhœa: in this instance, it is alleged, nothing particular was found on examination of the chest. In the second case, furnished by M. Fournet (the second in the essay), the lungs are simply said to have been affected with general emphysema, and no information is given as to the measures taken to place beyond question the alleged absence of pulmonary tubercles or gray semi-transparent granulations. The other cases are still more deficient in details than these, so that it would be perfectly useless to notice them any further. "And if any surprise be expressed," says M. Valleix, "at my questioning the perfect soundness of the lungs in these cases, when conscientious persons had affirmed the fact to be so, I can only reply that the time has come, when mere assertions, relative to points of observation, should be measured at their real value, and that for my own part I have witnessed so many errors arising from superficial observation, that I am perfectly persuaded nothing can supply the place of full and

[1] Traité pratique de la phthisie laryngée, da la laryngite chronique et des maladies de la voix. Paris, 1837.

[2] Archives de Médecine, t. xlviii, p. 304.

accurate descriptions. And in the matter under consideration such descriptions are peculiarly called for, as it is notorious that lungs which on first sight appear healthy, are sometimes, on careful examination, found to contain tuberculous granulations." I may add further, that in the cases given by MM. Trousseau and Belloc, we are left in the dark as to the pre-existence of syphilitic affections in the individuals to whom they refer; now these affections, as every one is aware, are capable of entailing, quite independently of tuberculous disease of the lungs, ulceration of the mucous membrane of the larynx, either primarily or as a sequence to affection of the cartilages. Again, it is worthy of remark that MM. Trousseau and Belloc, who must have opened a great number of bodies, do not appear to have themselves observed a single case of laryngeal ulceration without pulmonary tubercles; at all events they relate none of the kind. Hence, everything concurs in demonstrating the truth of the law I have laid down.

These reflections are naturally applicable to cases of ulceration of the trachea, described under the title of tracheal phthisis, under the belief that the ulcerations observed were primitive, or developed in persons whose lungs were free from tubercles. The most remarkable contribution upon this subject, as far as I am aware, is assuredly the thesis of M. Cayol. But the cases collected by this observer are far from implying all that they have been made to signify. M. Cayol's dissertation contains, in truth, six cases of ulceration or perforation of the trachea occurring in persons whose lungs were free from tubercles. But[1] in three of these cases the perforation was effected from without inwards, through the action of a tumour; these cases may of course be at once set aside, belonging as they do to a class having no connexion with the subject before us. In the three others the ulceration advanced from within outwards; but it is only stated in one of these that no syphilitic disease had previously existed,—so that this case is in reality the only one which can be considered to furnish an exception to the law I have established. The two others are inadmissible as elements of the discussion, because the ulcerations might have been the consequence of syphilis, itself a special cause of ulceration.

[1] Examen de l'Examen de M. Broussais. Paris, 1834. p. 11. [By the author.]

It may be asked, after this review of facts, how the illustrious Laennec could have stated, that though ulcerations of the trachea are sometimes discovered in phthisical subjects, their development in perfectly healthy persons is much more common.[1] Such an error as this is scarcely explicable even on the supposition that its author wrote from mere memory; and it furnishes a striking example of the absolute necessity of never enunciating a general proposition except upon the evidence of accurate facts, committed to paper at the time of observation and analysed with care.

With the exception of three cases of slight œdema of the glottis (Case XLV), the anatomical changes described are the only ones which I have met with in these organs in phthisical subjects.

CHAPTER II.

ORGANS OF CIRCULATION.

SECTION I.—HEART AND PERICARDIUM.

Phthisis has been enumerated by some authors among the causes of aneurism of the heart,—an opinion which, it appears to me, cannot claim the testimony of facts in its favour. Of one hundred and twelve individuals cut off by phthisis, three only exhibited any obvious enlargement of the heart. The organ was increased in size in these cases by about one third or one fourth of its bulk, and the left ventricle the part affected; no symptoms of aneurism had been felt during life. In a much greater number of cases the dimensions of the heart were below the natural standard, the organ being scarcely one half or two thirds of its usual size.

The general emaciation and diminution in the mass of circulating fluids in phthisical subjects afford a ready explanation of this condition of the heart. But we have not the same

[1] De l'Auscultation Médiate. 2ème édit. t. i, p. 267.

facility in explaining a dilated state of the cavities of the organ; for the obstacles to the circulation in the lungs (to which it might be ascribed) are generally slowly established, so that the capacity of those organs remains proportional to the quantity of the fluids. Besides, were obstacles of this kind necessarily followed by enlargement of the heart, this enlargement ought to occur on the right side of the organ; now this has not been observed.

Diminution of the heart's bulk existed, in the great majority of cases, where the disease had followed a slow course; and also in some of those where it had rather rapidly destroyed life,—in the course of five months for example.

The heart generally possessed the natural degree of firmness. I, however, found it more or less flaccid and soft in about a fifth part of my cases; this diminution of consistence bore no proportion to the duration of the disease or the age of the persons exhibiting it. In other instances the organ was firmer than natural,—a condition principally observed, where the parietes of one or other of its cavities had undergone thickening.

Thickening of the parietes existed to a remarkable amount in seven cases; six times in the left ventricle, once only in the right,—the reverse ratio to that which should have existed, did the cause of the phenomena reside in obstruction of the pulmonary circulation. In these different cases the cavity of the heart was contracted, and its size had either not undergone obvious change or was less than natural; under the latter circumstances we must admit that retraction of the tissues on themselves and not hypertrophy had taken place. The phenomenon was the same as that so frequently observed in the intestines when they are contracted.

Attenuation of the ventricles was of rare occurrence; I only observed it twice on the right, and four times on the left, side. So that, considered under all aspects, the cavities of the right side of the heart appear to retain their natural characters much more frequently than those of the left; and the facts we have reviewed show that the only influence we can fairly ascribe to phthisis on the heart is that the disease determines diminution of its bulk, as it does of that of other organs.

The profound and admirable researches of M. Bizot upon

the heart and arterial system[1] corroborate what I have said upon the diminution of the heart's size in phthisis. They have also shown that the walls of the ventricles, more especially of the left, are thinner in the victims of phthisis than of other diseases; so that, adds this observer, the diminution of the heart's size in phthisical subjects bears not only on the organ taken as a whole, and on the capacity of the ventricles, but also on the thickness of the walls of those cavities.

I have not in a single instance found tubercles in the substance of the heart; a fact which shows that they must, at the least, be of rare occurrence there.

Nevertheless, a very remarkable instance of the kind, which I lose no time in placing before my readers, was published in the 'Archives de Médecine,' for January, 1833. The case (observed by Dr. Townsend) refers to a subject aged 61, who died in hospital, five weeks after admission, of an affection which had lasted a year, and been mainly characterized, in respect of symptoms, by difficulty of breathing and dulness of the chest under percussion. The patient derived most relief from being bled. On examination after death, a tuberculous tumour was discovered in the substance of the walls of the heart; this mass pressed upon the pulmonary veins at the point of union with the left auricle with such force that a probe was with much difficulty passed through them into the auricle. The lungs were the seat of manifest fluctuation, and when cut into gave out a jet of blood like the sac of an aneurism, in such manner that three pounds and a half of blood escaped. The caliber of the pulmonary veins which furnished the blood was at least quadruple of that natural to them; and this dilatation existed from the minutest radicles to the largest branches; the main trunks formed two large sacs outside the auricle. The right lung was the seat of a similar change, though to a somewhat less amount; there were a few miliary tubercles in the lungs.

Here, it will be readily admitted, is a very remarkable cause of premature death in phthisis,—an affection in which the causes of such an event, it will be seen as we advance, are peculiarly numerous.

In the admirable treatise already referred to, M. Bizot has added another to the number of structural changes observed in

[1] Mémoires de la Société Médicale d'Observation, t. i, p. 290.

the heart—a fatty condition of this organ, observed in four phthisical subjects, all of them females.[1] In these four cases the lower half of the anterior wall of the right ventricle had undergone the fatty transformation; and, close to the columnæ carneæ, small discoloured fibres, surrounded with fat, appearing to spring directly from the adipose tissue, and uninterruptedly continuous with the muscular fibres of the columnæ, presented themselves. The heart was surrounded with a considerable mass of adipose substance, although all subcutaneous fat had disappeared. In all these cases the liver was fatty.

I found the *pericardium adherent to the heart* in two cases. In a third, both laminæ of the serous sac were invested with a false membrane about one line [2 millimeters] thick, moderately firm, and containing a small quantity of transparent serosity in its substance. The individual exhibiting this example of pericarditis had suffered greatly from palpitation, and during the twenty-three days he remained under my notice, his pulse was extremely irregular.

In my 'Essay on Pericarditis,' I have related a case in which some semi-transparent gray granulations, seated under the serous lamina of the pericardium, acted in all probability as the exciting cause of the pericarditis under which the patient laboured. When simple, I have always seen this affection terminate favorably; but it is readily conceivable that it must often prove fatal, when arising under the influence of gray semi-transparent granulations,—even in subjects in whom the lungs contain but few tubercles.

In one tenth of my cases there was serous effusion in the pericardium to the amount of from about $4\frac{4}{5}$ to $9\frac{3}{5}$ ounces [150 to 300 grammes].

The state of the heart was very much the same in other chronic diseases as in phthisis. Of eighty subjects dying from some chronic affection of non-tuberculous nature, five presented some enlargement of the organ. In nine cases it was flaccid and soft; in eight the left ventricle was hypertrophous, in seven attenuated; whereas hypertrophy and attenuation of the right ventricle existed in only a single instance. Lastly, the heart was considerably smaller than natural in thirty sub-

[1] Op. cit. p. 259.

jects, somewhat more than one third of the whole number;—a higher proportion than that noticed in phthisis. This difference arose from the cancerous affections, included in the former category, more especially those of the stomach and uterus; in persons affected with these maladies, in truth, diminution of the heart's size was at once more frequent and more marked than in any others.

M. Bizot also observed fatty transformation of the heart in non-tuberculous subjects, but invariably in females. In these cases, very different from what was noticed in the case of phthisis, the parietes of the heart only contained a few particles of fat, varying in size from that of a pin's head to that of a pea, placed between the fibres of the columnæ carneæ, in immediate contact with the lining membrane of the ventricles, through which they were very distinctly perceptible. Exposed to the action of heat on blotting paper, the yellow substance, forming the particles described, greased it obviously.[1]

This is an extremely remarkable fact; inasmuch as it appears to prove, on the part of phthisical subjects, more especially those of the female sex, an amount of tendency to fatty transformations much greater than that prevailing in other diseases. The importance of the fact will appear more obvious, when we come to the subject of morbid states of the liver.

I have not in any instance observed tubercles or gray semi-transparent granulations in the walls, or under the serous membrane of the heart, without finding a certain number of tubercles in the lungs: in other words, subjects presenting such deposits in those situations were phthisical.

SECTION II.—AORTA.

The aorta was perfectly healthy in the majority of cases; and of a more or less bright red colour, either generally or over a limited extent of surface, in one fourth part of my cases. This redness penetrated more or less deeply into the substance of the middle tunic, and affected the entire circumference of the vessel, whether it contained a little blood or none at all; so that it could not in all cases be considered an effect of imbibition.

[1] Op. cit. p. 259.

Sometimes it extended into the large trunks arising from the aorta, more especially the carotids. With a single exception, this condition was only noticed in individuals aged from twenty to thirty-two years. (Cases I, XXX, LIV, &c.)

Organic alterations of the aorta, namely, the soft yellow patch, and the white cartilaginous patch, with the ulcerations they so frequently entail, and lastly, the osseous patch, were noticed with somewhat less frequency than red discoloration,—namely, in the sixth part only of my cases, either simple or complicated, in persons varying in age from thirty-five to seventy-five years. Generally speaking, these changes of texture were in a more advanced state, and more frequently met with, near the bifurcation of the aorta than elsewhere.

Reflecting upon the diminution in the mass of the circulating fluids in phthisis, we are naturally led to expect that the arteries, and more especially the aorta, must be of smaller caliber in persons dying of that affection than in the victims of acute diseases. A difference of this kind does actually exist, but it is perhaps less in amount than would, on first consideration, have been supposed. Thus, in twelve subjects, aged from twenty to thirty years, cut off by typhoid fever, the mean width of the aorta, on the level of the free borders of the sygmoid valves,—about one inch and two lines [3 centimeters] below the origin of the left subclavian artery,—about one inch and two lines [3 centimeters] above the cæliac axis,—and the same distance above the bifurcation of the vessel, was respectively about two inches five lines, one inch nine lines and a half, one inch and a half, and ten lines [about 60, 43, 38, and 20 millimeters]. Now in an equal number of phthisical subjects of the same age, the artery measured at the same points, about two inches four lines and a half, one inch eight lines and a quarter, one inch five lines and a half, and ten lines [57, 40½, 34¾, and 20 millimeters]. The difference here exhibited is inconsiderable, but real nevertheless, and proportional in all parts of the vessel to its caliber; in such manner, that where its dimensions are smallest, the difference was about one line [2 millimeters] less than anywhere else.[1]

[1] The inequality of width of the aorta in the space comprised between the left subclavian and the cæliac axis, shows that that vessel is not formed of a succession of cylinders; but that it is actually conoid. I have satisfied myself that the case is the same with the femoral artery, the primitive carotid, and other vessels of less size.

I have instituted this comparison between subjects of the same age, because the dimensions of the aorta differ greatly at different periods of life. Thus from the fortieth to the fiftieth year, it measures from about two inches fives lines and a half to two inches and nine lines [68 to 70 millimeters] in width, on the level of the free border of the sygmoid valves, in persons dying of acute diseases; about two inches and seven lines [64 millimeters] in phthisical subjects; and only about two inches and five lines [60 millimeters] in individuals of the same age dying of cancer. These differences subsist through the entire tract of the artery, in proportion to its caliber. The measurement in cancerous subjects deserves to be particularly noticed, from its corroborating what has been already said respecting the smallness of the heart in such persons.

The morbid changes of the aorta just enumerated were also discovered in subjects dying of other chronic affections, but not in the same proportions; redness existed in the eighth part of the cases, organic changes in one half of them. This difference might lead us to suppose the various conditions of the aorta dependent in some manner upon the nature of the affection which had proved fatal, but it is perfectly explicable by the age of the two series of subjects. In truth, whether observed after phthisis or some other chronic disease, it was always in subjects of from twenty to thirty-five years of age that redness of the aorta existed; now the majority of phthisical persons die in youth, whereas it is generally at a more advanced age that death occurs from other chronic diseases.

The frequency of organic alterations of the aorta, compared with the extreme rarity of those of the heart,[1] lends support to the position previously laid down:—namely, that the tendency to alterations of structure of this class is not always proportional to the activity of function of the parts they implicate,—the functions performed by the aorta being, so to speak, merely mechanical.

In the cases where the lining membrane of the aorta was red, it was not thickened; in some instances only, in certain

[1] Of three hundred and fifty subjects dying of all kinds of disease indiscriminately' two only presented organic alterations of the heart;—in both instances the alteration consisted of partial transformation of its tissue into cancerous matter.

spots where the redness was of very deep tint, I found the membrane less firm, and more easily separable from the middle coat, than natural. The latter tunic, even when discoloured, exhibited no change in respect of consistence or thickness; and as redness (generally speaking the sole morbid change in the lining membrane under the circumstances in question) is not sufficient in itself to characterize inflammation, we are necessarily obliged to wait for the evidence of further facts, before venturing an opinion upon the nature of the state under consideration.—It is no doubt true that Bertin[1] relates a case in which he found the lining membrane of the aorta of a bright red colour, and covered with membraniform plastic exudation,—that is, manifestly inflamed. But the author does nothing more than describe the redness; he speaks neither of the consistence nor of the thickness of the tunics of the artery; so that his case, interesting as it is, supplies us with no means of determining in a general manner when red discoloration of the aorta should be considered inflammatory; and for the elucidation of this point, as of a multitude of others, additional facts are required.

The additional facts which appeared to me so requisite, at the period the former edition of this work was published, have been since (now some years past) collected by M. Bizot. This observer has shown that aortitis, when general, gives rise to symptoms, previously unknown,—symptoms of which he has fixed the precise signification, and which did not exist in the cases we have been considering, no more than in many others, cited by writers as examples of aortitis. It is, at the present day, impossible to admit the existence of this malady, unless pseudo-membrane, commonly of very soft consistence, have been formed; now there was no such formation in the cases before us.

As regards the yellow and white patches of the aorta, the inquiries of M. Bizot, which have thrown such light on the subject of the heart and great vessels, make it obvious that one and the same cause does not preside over the development of both. The yellow patches, which originate in an almost imperceptible spot of the same colour, arise independently of inflammation; whereas the white patches, which are an advanced stage of a soft albuminous pseudo-membrane, similar to that observed in general aortitis, are evidently inflammatory.

[1] Traité des Maladies du Cœur. Paris, 1824.

CHAPTER III.

ORGANS OF DIGESTION.

SECTION I.—PHARYNX AND ŒSOPHAGUS.

The pharynx and œsophagus were almost always in the natural state.

Among one hundred and twenty subjects, four only presented any lesion of the *pharynx;* in these instances the part was the seat of numerous small ulcerations, very uniformly scattered over the whole surface of the mucous membrane, which was itself somewhat thicker than natural in the interspaces between them. (Cases XXI, LII.)

The same number of individuals supplied six examples of ulceration of the *œsophagus.* In one of these cases there was only one ulceration; it measured about five lines [10 millimeters] in diameter, and was placed in the middle part of the organ; an extremely delicate lamina of cellular tissue formed its fundus, whereas the mucous membrane was thickened around, and lined with a layer of cellular tissue, separated from its attachments to an extent of about two lines [4 millimeters]. In the other cases there was a great number of ulcerations, and these, for the most part, very small, superficial, and wearing the appearance of having been made with a punch. (Case XXXVIII.)

I have pretty frequently seen the internal surface of the œsophagus invested with a sort of detritus, or kind of pseudo-membrane, resembling the pultaceous patches so frequently developed in the mouth,—patches to be hereafter spoken of again. In these cases the epidermis of the œsophagus had disappeared, and its mucous membrane exhibited no change of colour, consistence, or thickness. (Case LIII.)

The lower part of the œsophagus was softened and attenuated in three subjects; and this morbid change, which affected all its tissues, existed in the stomach also.

I did not observe any symptom referrible to ulceration of the pharynx or œsophagus, or to attenuation of the lower part of the latter. The same may be said of the pultaceous pseudo-membrane spoken of, unless we ascribe to its presence the difficulty of deglutition complained of, for a somewhat considerable time, in one case,—a notion, assuredly, of very doubtful accuracy. (Case LIII.)

The bodies of individuals dying of all other chronic diseases except phthisis did not present, in any case, either ulceration or attenuation of the pharynx or œsophagus; and the only acute affections, which exhibited among their anatomical changes ulcerations of the mucous membrane of the latter, were cases of continued fever of severe type. The sort of detritus, or pseudo-membrane referred to, existed more or less frequently in the victims of chronic affections of all kinds.

SECTION II.—STOMACH.

§ 1. *Size and Position of the Stomach.*

The size and position of the stomach sometimes presented very remarkable deviations from the natural state of things. In nine of ninety-six subjects in whom these points were carefully examined, the stomach was doubled or trebled in size; and reached lower than natural in the cavity of the abdomen; in six of these nine the great curvature had reached the level of the crista of the ileum, (Case XII;) in the other three it only extended a short way beyond the umbilicus. In all these cases the liver was of large size and carried downwards to the same amount as the stomach; the latter viscus was overlapped by the former to a considerable extent.

The displacement and increased size of the stomach, when carried to the excess mentioned, are, it might almost be said, proper to phthisical subjects; they are very rarely observed in persons dying of other diseases, a circumstance rendering it presumable that in the majority of cases they are a natural result of the repeated concussions the body undergoes from long-

continued cough. Among two hundred and thirty subjects dying of various acute and chronic diseases two only were thus affected;—in one of these persons the original affection was of the heart; in the other caries of the spine. In both of them the great curvature of the stomach lay on the same level as the crista of the ileum, and the liver of large size was seated low in the abdomen; so that, whenever the conditions of stomach referred to were present, there was an invariable relation between the state of the liver and that of the stomach.

The textural changes of the latter organ principally implicated its mucous membrane. This was softened and attenuated, sometimes even destroyed in certain cases: of a more or less bright red colour, and sometimes thickened anteriorly in others; or there were instances in which the red discoloration, accompanied with very considerable softening, was limited to the fundus. In some cases there were ulcerations; more frequently the mucous membrane exhibited a very remarkable mammillated aspect, &c. I shall describe these different states in the order in which they have now been enumerated.

§ 2. *Softening, with Attenuation, of the Mucous Membrane of the Stomach.*

This form of anatomical change, which I have already described elsewhere,[1] existed in about one fifth of the cases, in nineteen out of ninety-six subjects. Its most common seat was the upper part and more especially the fundus of the stomach; not unfrequently it implicated half the surface of the viscus, sometimes more,—or it was limited to a space varying from twenty-eight inches five lines to thirty-six inches [72 to 90 centimeters] only. (Cases I, III, IV, VII, L, LV, XL, XXX.)

The parts affected with the change under consideration had a blueish white, or slightly yellowish hue, were free from mucus, and remarkable for the number, more or less considerable, of large vessels ramifying upon them, and either empty or filled with blackish blood. These parts were sunken, and the mucous membrane more or less prominent around them. These different appearances struck the observer on first sight, and pointed out the places which had undergone the change in ques-

[1] Mémoires ou Recherches anatomico-pathologiques. Paris, 1826. p. 1 et seq.

tion. The mucous membrane was white, semi-transparent, sometimes grayish or brownish-red coloured; it was extremely soft, to such a degree that, far from unfrequently, its consistence had decreased nearly to that of moderately viscid mucus. In respect of thickness it resembled more or less closely the mucous membrane of the small intestine, and was sometimes even altogether destroyed over a certain extent of surface. In several cases in the close neighbourhood of, or beside, parts equally softened and attenuated, appeared others much more remarkable for thinness than softness, and vice versâ. An incision carried from the softened and attenuated mucous membrane to that which either retained its natural properties or had not undergone the same species of change, showed how very considerable the difference of thickness in question was.

Instead of being spread over a continuous surface, this anatomical change sometimes exhibited itself in the form of bands, when its peculiar characters were generally less strongly marked. These bands, from three to four and a half lines [6 to 9 millimeters] long, by two and a half to four lines [5 to 8 millimeters] broad, and sometimes more, were seated more or less near each other, while the intervening mucous membrane presented the natural amount of thickness.

The cellular tissue underneath the softened and attenuated mucous membrane was, generally speaking, healthy. In four cases only it had lost all firmness, and gave way under the slightest traction; the muscular and peritoneal coats had undergone the same change in the corresponding points. I have thus several times found the stomach perforated, although the greatest care had been used by myself in separating it from the neighbouring parts, and although the absence of peritoneal effusion indicated that the perforation had not existed during life. (Cases VII, LV.)

In the majority of cases the part of the mucous membrane continuous with that just described, was mammillated, and of red or grayish colour over a surface of considerable extent, (Cases I, IV, XL;) sometimes even more or less thickened or ulcerated; or (this was, it is true, of much rarer occurrence) the attenuated or softened part was continuous with another portion of the membrane not less attenuated, but of a bright red colour, and gradually increasing in thickness. (Case XXX.)

Where the mucous membrane was red, thickened, and sometimes even softened, the existence of inflammation could not be questioned; a mammillated state of the membrane, coupled with gray discoloration and ulcerations, indicated, as we shall presently see, inflammation also; in such manner that, in more than half the cases, the mucous membrane, when attenuated, softened, and discoloured, was actually continuous with parts in a state of inflammation. It would appear natural, for this reason even, to regard softening with attenuation as a result of inflammation; and this motive for so judging its nature is strengthened by the circumstance, that the symptoms observed were those of gastritis, even when the condition in question was not accompanied with accessory morbid changes.

However, numerous reasons, which I have elsewhere explained, render it improbable that such is the true interpretation of the phenomena; and it appears admissible that, in a certain number of cases, the softening and destruction in question are the result of some chemical action, the conditions of which are, nevertheless, still undetermined.[1]

§ 3. *Redness, with Thickening and Mammillation or diminution of Consistence of the Mucous Membrane in the situation corresponding to the anterior wall of the Stomach.*

This description of morbid change presented itself in eight out of ninety-six subjects. The mucous membrane, when thus affected, was in some cases smooth, in others, uneven on the surface and mammillated, and almost invariably covered with a very abundant and viscid mucus. When such mucus appeared in other parts of the stomach, besides its anterior surface, it exhibited greater tenacity and existed in greater quantity there than elsewhere. In some instances, the mucous tissue was less firm and thicker than in the natural state. In one of these instances a soft yellowish pseudo-membrane, which did not spread beyond the limits of the tissue thus modified, covered the entire of the red and thickened part.

The morbid state now described, evidently of inflammatory

[1] Recherches anat. pathol. et thérap. sur la Fièvre typhoïde, 2ème éd. Paris, 1841. t. 1, pp. 156, 157.

nature, existed in subjects of various ages, in whose cases the principal malady had lasted a variable space of time, between three and five years it occurred seven times more frequently in females than in males. (Case x, xii, lii.) Such portions of the mucous tunic as were free from this change exhibited, more or less perfectly, the characters of health.

The position and dimensions of the stomach had, under these circumstances, undergone remarkable changes. The viscus was of large size, and reached inferiorly the crista of the ileum in four individuals; in the others, without being particularly lower than natural, it had attained unusually large dimensions. In all of these cases, the liver, either enlarged or simply carried downwards below its natural position, covered a considerable portion of the stomach; hence we are almost forced to conclude that the liver exercises a certain influence on the development of inflammation of the mucous membrane of the stomach, limited to its anterior surface. This influence once admitted, it becomes quite intelligible why females, in whom the liver is much more frequently enlarged than in men, should be much more subject than males to this species of inflammation.

When engaged with the discussion of the symptoms, we shall find that in many cases the outset of the disease might be traced to a period varying from one to even three months before death.

§ 4. *Redness and Softening of the Mucous Membrane of the Fundus.*

Seventeen of the ninety-six individuals, already referred to, were subjects of this morbid state. The portion of the mucous membrane so affected exhibited a red colour, generally of dull tint, was sometimes a little thickened, and so extremely soft, that even the smallest strips could not be obtained. (Cases xxii, xxiii.) Rarely limited to the neighbourhood of the cardia, the softening implicated a more or less considerable extent of the fundus, sometimes indeed its entire surface. The remainder of the mucous tunic was either in the natural state, or uneven, mammillated, and of grayish, or sometimes pinkish colour. Small ulcerations presented themselves in certain cases.

The textural change described was very rarely accompanied by symptoms, which could fairly be ascribed to it; nevertheless, its characters seem to me so distinctly marked, that no doubts can be

entertained as to its nature. Intense redness, in truth, associated with softening, and sometimes thickening, cannot be otherwise than the result of inflammation; and the general absence of special symptoms appear to me simply to show that the inflammation sets in during the closing days of life, in the same manner as I found to be very frequently the fact in the case of the lungs and pleura. There can be no doubt (and I shall have occasion to recur more than once to the proposition) that debility on the part of the individual does not prevent the majority of diseases from exhibiting the greater number of their peculiar symptoms, but it certainly alters, in some instances, the character, and diminishes the number, of those symptoms. Thus, pneumonia, supervening as one of the ultimate phenomena of phthisis, rarely gives rise to the expectoration of viscid, yellowish, or rusty and semi-transparent sputa; and in many cases the disease remains perfectly latent. The same might be said of pleurisy. Now what occurs in the case of inflammation of the pulmonary parenchyma and of the pleura may, and must, take place in the instance of the mucous membrane of the stomach,—an additional motive for regarding the morbid state before us as an inflammation originating towards the close of life.

No pathologist, it is to be presumed, will be disposed to view the redness and softening, we have been speaking of, as a simple cadaveric phenomenon; for stasis of blood does not produce softening of the tissues, and it is impossible to ascribe one and the same anatomical change to two such completely different causes.

§ 5. *Mammillation with grayish or reddish Discoloration of the Mucous Membrane of the Stomach.*

In this state, which I have observed eighteen times independently of the preceding lesions, the mucous membrane, instead of exhibiting the uniform and velvet-like surface natural to it, presented, over a surface of variable extent, certain prominences of various forms and dimensions, generally speaking rounded, of from one to two lines [2 to 4 milllimeters] in diameter, resembling granulations in appearance, and separated from each other by deep furrows of variable length, and one line [2 millimeters] or a little less, broad. The membrane was almost always of grayish colour, pretty frequently shaded with

a pale red tint. In certain instances I found it firmer and thicker than in the natural state. In some cases also small ulcerations, not penetrating completely through the mucous membrane, were discernible.

This mammillation exhibited itself in cases where the stomach had undergone considerable distension, as well as in others remarkable for the contracted state of the viscus. This simple fact shows that the appearance cannot be attributed to mechanical causes; and the attenuation of the membrane in the furrows, the ulceration and occasional thickening of its substance, with the almost invariable change of colour, are so many circumstances indicative of an actually morbid condition. The same circumstances, to which we must add the mammillated appearance existing in cases were the mucous membrane was obviously inflamed (where, for example, the inflammation did not extend beyond the anterior surface of the viscus), appear to show that this state resulted from inflammation, ordinarily of slow type. At least it is fair to conjecture that such was its type, in consequence of the absence, or extreme insignificance, of attending symptoms and the gray discoloration commonly observed in the membrane,—a form of discoloration so usual in parts affected with chronic phlegmasiæ, and around intestinal ulcerations.

§ 6. *Ulcerations of the Mucous Membrane of the Stomach.*

Commonly small and few in number, these ulcerations existed in one twelfth part of the cases; they were associated, except in two instances, with some other morbid change of the mucous membrane of the stomach. In one of these instances a single ulceration only, about seven inches [18 centimeters] in superficial extent, existed. (Case XXIX.) In the other the ulcerations were small, but eighty in number. (Case XIII.) In every instance but one, the mucous membrane had retained the same thickness, consistence, and colour around, as between, the ulcerations; so that they had the appearance of having been made with a punch. The exceptional instance referred to was supplied by an individual in whose stomach an ulceration with round edges, formed of red, softened, and thickened mucous membrane, existed in the neighbourhood of the pylorus: the other coats appeared in nowise remarkable.

The submucous tissue forming the fundus of the ulcerations was sometimes thickened; and in one case, that of the single large ulceration, destroyed in some points.

When the ulcerations were unaccompanied with any other alteration of the mucous membrane, the history of the symptoms led to the inference that their formation had occurred some length of time before death.

§ 7. *Other morbid changes of the Mucous Membrane of the Stomach.*

In six subjects in whom no alteration in respect of consistence or thickness of the membrane existed, I found it of a more or less bright red colour throughout its entire extent; the redness disappeared after two or three hours' maceration. Gastric symptoms had exhibited themselves in several cases two or three days before death, (Case II;) so that the change in question may, on anatomical and symptomatical grounds, be regarded as the produce of recent and slight inflammation.

I have four times seen the mucous membrane of the stomach excessively softened in the greater part of its upper extremity, without coexisting change of colour or thickness; in these cases I did not observe any notable gastric symptoms.

In a subject who died the day of his admission into hospital, the mucous membrane of the stomach exhibited seven large mammillæ, nearly uniformly disseminated over its surface, and measuring from about two to three lines [4 to 6 millimeters] in diameter, and two lines [4 millimeters] in height. The mucous tunic was itself slightly red, of good consistence, and about one line [2 millimeters] thick in these places. About an inch and two lines [3 centimeters] below the cardiac orifice the membrane was slightly prominent, and raised up here by a blueish-white liquid, rather viscid, very imperfectly soluble in water, and contained in a certain number of small cells developed in the submucous tissue.

Lastly, one phthisical subject exhibited an example of a sort of cicatrization of the mucous membrane of the stomach; and another, of the transformation of a limited extent of the muscular coat into cartilaginous tissue,—rare species of change, which I shall describe with care further on. (Cases XIV, XV.)

To resume :—In ninety-six cases in which the mucous membrane of the stomach was carefully examined and described, I found it

Attenuated	19 times
Red, and sometimes thickened, mammillated and softened on the anterior surface	8
Softened and of a dull or brownish red colour at the fundus	17
Mammillated, grayish, sometimes reddish, thickened .	19
Ulcerated, without any other change	2
Softened, without alteration of colour or thickness .	4
Of a more or less bright colour over the entire surface, without alteration of consistence or thickness .	6
Raised up by a viscid liquid, &c.	1
Presenting the appearance of cicatrization . .	1
	77

Hence the mucous membrane of the stomach was perfectly, or almost perfectly, healthy in *nineteen* cases only, or one fifth of the entire number.

I have not in a single instance, either in subjects exhibiting a completely healthy state of the mucous membrane of the stomach, or in those in whom it was mammillated or ulcerated, found tuberculous matter or gray semi-transparent granulations in its substance or underneath it ; and yet I have attentively examined the mucous membrane of the stomach in four hundred phthisical subjects. This is tantamount to saying that if tubercles are ever developed in the substance of the walls of the stomach, such must at least be a singularly rare occurrence. M. Andral states that out of several hundred subjects observed by himself, two only had tubercles under the mucous membrane of the stomach,[1] and M. Tonnelé never met with this condition in children.[2] Yet the mucous membrane is often inflamed—and the inflammation of chronic character—in phthisical subjects, persons in whom a strong tendency to tuberculous deposition exists ; and thus, the complete absence or extreme rarity of tubercles in the substance of, or underneath the mucous membrane of the stomach, would suffice to prove the slight influence of

[1] Clinique Médicale, t. ii, 4ème éd. p. 270.

[2] Journal Hebdomadaire, t. v, p. 139.

inflammations on the development of those productions, and to show that the true causes of their generation must be looked for in agencies and influences of a different stamp.

Facts of the same character have presented themselves to my notice since the publication of the former edition of this volume; —and to speak only of those collected after that period at the Hospital of La Charité, I may observe, that among fifty-four phthisical subjects in whom the stomach was carefully examined, I found the mucous membrane ulcerated in six cases, in two of them without any other morbid change; and mammillated in twenty-two, in four of which the membrane was besides of pink colour and softened.

The alterations just described are not proper to phthisis; I have observed them, though in different proportions, in other chronic diseases. In ninety-four subjects dying of some one of these affections, the mucous membrane of the stomach was

Attenuated and softened	6 times
Red, and somewhat uneven on the anterior surface .	2
Softened, and of brownish red colour in the fundus .	6
More or less red over the entire surface, without softening .	18
Mammillated, of grayish colour, sometimes thickened or ulcerated	16
	48

That is to say, the membrane was more or less diseased in one half of the cases, whereas its structure was altered in four fifths of phthisical subjects.

SECTION III.—DUODENUM.

The duodenum almost invariably exhibited the characters of health. In some cases its mucous coat was of pinkish hue; in others of a grayish colour, produced by an infinite number of little black points scattered over the surface. In a fair number of cases the mucous follicles were so much enlarged as to exhibit double or treble their natural dimensions, without coexisting

alteration of structure. In three out of sixty cases ulcerations displayed themselves, varying in diameter from one line to one line and a half [2 to 3 millimeters], in number from three to ten, and were of pale colour in two cases. (Case IX.) In the third case there were two ulcers from three to four and a half lines [6 to 9 millimeters] in diameter; in these the fundus was blackish, and formed, as in the preceding cases, of the submucous cellular tissue, somewhat thickened. The mucous membrane presented no remarkable appearance in their neighbourhood.

In the cases, where the ulcerations were small, the liver contained cysts, no less small, filled with a greenish pulpy matter; but there was no connexion between the gray or pink colour of the mucous membrane of the duodenum, the enlargement of the mucous follicles, and the passage of the liver into the fatty state.

I once found a fibrous tumour, of the same kind as those so common in the uterus, in the muscular coat of this part of the intestine; it was about the size of a hazel-nut.

Since the publication of the former edition of this volume I have again studied with attention the state of the mucous membrane of the duodenum in phthisical subjects; in sixty of them I found nine cases of ulceration,—a higher proportion than that before noticed, and probably arising from my examination having been more complete. The mucous membrane was more or less red, and somewhat softened in four cases; in one instance there were a few small submucous tubercles discernible.

The state of the duodenum did not present precisely the same characters after other chronic diseases as in the victims of phthisis; sixty-five subjects furnished only one case of ulceration.

SECTION IV.—SMALL INTESTINE.[1]

Before describing the various lesions of the small intestine, it may be well to direct the reader's attention to the natural

[1] A close analogy may be discovered between several remarks made in this section and those of Billard in his work upon the 'Gastro-intestinal mucous membrane.' Without meaning to attach too much importance to my own observations, I may yet

characters of its lining mucous membrane, and point out a peculiarity of structure, commonly neglected by observers, which it invariably presents in the healthy state.

§ 1. *Mucous Membrane of the Small Intestine in the natural state.*

In the healthy state the walls of the intestine are very thin and semi-transparent,—to such a degree, that if a fragment of them be spread out on the fingers, the lines and furrows in these may commonly be distinguished through it.

Here are, nevertheless, the mucous, muscular, and peritoneal coats united by a little cellular tissue. As soon as any one of these tunics undergoes morbid alteration of any kind, the semi-transparency disappears.

The mucous membrane of the small intestine is naturally white, and somewhat thicker in the jejunum than in the ileum, where it may be compared to a sheet of blotting-paper.

If an incision be made through the mucous membrane, one side of this raised with a scalpel, and then seized with the points of the fingers or with a forceps, strips of from five to ten lines [10 to 20 millimeters] long, may be removed. This experiment suffices to show the amount of consistence of the mucous membrane in the natural state; and when such strips cannot be obtained in the manner described, the necessary inference is, that the tissue is more or less seriously altered in structure.

From place to place, at intervals of greater or less extent, there are seen on the surface of the membrane certain oval patches of very variable dimensions. They are observed in the lower three quarters, sometimes in the entire extent, of the intestine, and vary in number from twenty to thirty, or oftentimes more. They are seated opposite the attachment of the mesentery to the bowel, and measure from one inch and two lines to four inches and ten lines [3 to 12 centimeters] in width, by from six inches and five lines to eight inches [16

mention that these had been communicated to M. Chomel several months before the appearance of the work in question; and that, far from suppressing any of my own details in consequence of its publication, I have thought it expedient to leave them completely unaltered, as furnishing an additional proof, that the same attention in observing facts of the same order must of necessity lead to the same results.

to 20 centimeters] in length, and generally become more numerous and larger in the vicinity of the cæcum. They protrude but slightly from the general surface, yet sufficiently to render their prominence both visible and palpable; they are double, treble, or quadruple as thick as the surrounding mucous membrane, are perfectly opaque, and of white or grayish colour, sometimes studded with minute points of blue colour. They have not the villous aspect of the rest of the intestine; their surface presents a great number of granules, smaller than millet-seed, of a slightly yellowish white colour; and if a patch be raised up in the manner just described in respect of the mucous membrane generally, the same little granules are observed upon their adherent surface. Lastly, if one of the patches thus detached be held between the eye and the light, the intervals between the little granules appear thin and semi-transparent, very much as other parts of the mucous membrane.

This structure, which is not always demonstrable with the same facility, is peculiarly obvious in certain morbid cases, when the mucous membrane is of a deep red colour,—in consequence of affections of the heart, for example. Under these circumstances, the little granules retain their natural white and yellowish colour, while their interspaces are almost as deeply red coloured as the surrounding mucous membrane,—hence the former are rendered peculiarly distinct, and the patches appear, what they really are, an agglomeration of minute granules, doubtless of glandular nature, set in the substance of the mucous membrane.

The blue points so commonly seen on the patches, are the orifices of the grandular granules. At least this interpretation of the appearance seems placed beyond question by certain phenomena arising in the pathological state,—when the patches are, under these circumstances, highly developed, the blue points are replaced by open orifices, almost as large as the granules themselves in the natural state.[1]

The patches frequently present a somewhat different appearance from that just described, arising from variation in the arrangement of the crypts; I refer to cases in which the latter are confluent, the intervening spaces having disappeared. But

[1] The elliptical patches of Peyer have very recently engaged the attention of observers, and M. Casimir Broussais denies the glandular structure of these glands. Experience and time must decide.

under these circumstances the patches are not less easily recognized, and not less distinct from the surrounding mucous membrane, by their colour, opacity, and prominence.

The appearance of the patches differs in the ileum and jejunum; in these parts of the small intestine they are placed across the valvulæ conniventes, appear sunken in consequence of the prominence of these valves, and exhibit an areolar appearance on their surface, having much affinity to the aspect of a darn. But here, as in the ileum, they are of whitish or grayish colour and opaque, and are perhaps, in consequence of their dividing the valvulæ conniventes into two parts, more easily distinguishable in this part of the intestine than in that situated lower down. The areolar appearance just mentioned, too, is rare in the ileum.

The whitish isolated granules almost always discernible at the lower end of the ileum, underneath the mucous membrane, are subject to the same alterations as the patches; their distinctness, and the facility with which they may be discovered, vary with the same circumstances as those I have pointed out in the case of the latter.

Although, as a general fact, the size of the patches increases the nearer they are seated to the cæcum, it is however sufficiently common to find small ones between those of the largest dimensions: under these circumstances the oval form is exchanged for one more or less irregularly rounded. Close to the cæcum they are extremely numerous, and often cover the entire circumference of the intestine.

The patches do not participate, except in a very partial manner, in any morbid changes affecting the general tract of mucous membrane surrounding them. I have already observed, that when this membrane is red in diseases of the heart, the glandular granules retain their own peculiar colour. Where the mucous membrane was thickened, I generally found the dimensions of the patches natural, and their usual prominence consequently lessened in amount, or altogether removed. In certain cases—in continued fever of severe type, for example—while the mucous membrane is pretty frequently unaffected, and its thickness unchanged, the thickness of the patches increases greatly, the glandular granules enlarge, and their orifices become obvious and widely open: the structure of the patches is at first more evident than in health, but they soon soften, and while the

subjacent cellular tissue daily increases in thickness, they ulcerate and eventually undergo complete destruction. From this it becomes intelligible why the patches and ulcerated surfaces observed in typhoid fever are of oval or elliptical shape, are seated on the side of the intestine opposite the attachment of the mesentery, and almost always present themselves in the lower part of the ileum. It is also in these patches that the intestinal ulcerations of phthisis are most commonly seated; they are often indeed their exclusive seat, while the mucous membrane around remains perfectly healthy.

Lastly, the phenomenon of perforation of the intestine is accomplished within their area.[1]

§ 2. *Small Intestine in the morbid state.*

The morbid changes observed in the small intestine were considerable in number, and consisted of softening, thickening, and red discoloration of the mucous membrane, small submucous abscesses, turbuculous granulations more or less firm, and ulcerations.

Softening of the mucous membrane was not more common in the course of phthisis than of other chronic affections. Among seventy-five subjects I met with it but eight times, and in three of these instances to a slight amount only. In the five others the membrane was not firmer than mucus. (Cases XV, LV.) In all of them the softening implicated the entire tract of the bowel. In three cases a considerable degree of thickening and bright red discoloration coexisted with the softening; under these circumstances this change was evidently the result of inflammation. In a fourth subject there was thickening without red discoloration.

In the cases where the mucous membrane was neither red nor softened, I only once found it distinctly *thickened.*

It was more or less *red,* without accompanying change in point of thickness or consistence, in thirteen subjects. (Cases XXX, LI.) In five of these, the discoloration implicated the entire intestine; in the others was limited to a small part of its length,

[1] Vid. Mémoire sur la perforation de l'intestin grêle. (Mém. ou Recherches anatomico-pathologiques. Paris, 1826. p. 136.)

—the lower twenty-nine inches [72 centimeters] in the majority of cases. (Cases XXII, XLVI.) In none did the mesenteric vessels appear highly injected; the redness of the membrane consequently depended in all probability most commonly on some other cause than simple stasis of blood.

The granulations presented themselves with all the attributes of tuberculous matter; in some cases they appeared white, and much harder than in others, and exhibited almost the firmness and aspect of cartilage. Both kinds were of small size—that of a medium-sized pea, or generally speaking much less than this; originated under the mucous membrane, and were scarcely ever seen, unless when some ulcerations were discernible at the same time.

The hard, semi-cartilaginous-like granulations (Cases XXI, XL, LII,) were generally accumulated in great numbers, sometimes appeared through the entire tract of the intestine, at distances of an inch and two lines, two inches and four lines, or three inches and seven lines [3, 6, or 9 centimeters], more or less. When thus scattered over the entire surface, their number and size gradually increased towards the cæcum. In other cases they were much more abundant near the duodenum, and in the upper than in the middle third of the intestine, and were altogether absent in the lower third. When small, they scarcely equalled a small pin's head in bulk, and adhered firmly to the cellular coat,—the mucous membrane lying upon them and retaining the characters of health. When they equalled a pea or thereabouts in size, the mucous membrane was generally more or less red, thickened and softened, or even destroyed, where in contact with the adventitious productions. Soon after they themselves began to undergo destruction, which advanced daily; until this was completed the edges of the ulceration remained hard, white, and opaque, retaining very closely the characters of the original morbid formation, the primary cause of ulceration, and thus exhibiting the proof of their origin.

Granulations of the hard semi-cartilaginous kind were sometimes seated in the patches, more commonly in their interspaces, and equably distributed over the entire surface of the intestine. I have never found them in any other situation than immediately under the mucous membrane; and in no single case did they occupy the interstices of the muscular fibres.

Granulations of the *tuberculous* species were much less numerous than the preceding, when these were very abundant. They were seated around or in the centre of the ulcerations, in the interstices of the fleshy fibres, between the peritoneum and the muscular coat, on or between the patches, and almost invariably in greater numbers near the cæcum than elsewhere. (Cases VI, VIII, XIV, XX, XXIII, L, &c.) I have never observed them near the duodenum.

To these granulations succeeded small ulcers, produced by the same process as the tuberculous cavities of the lungs. The tuberculous matter softened, and when softening was more or less perfectly accomplished, the corresponding mucous membrane appeared red, thickened, and softened,—or it was altogether destroyed and the contents of the abscess evacuated on the surface of the bowel. Hence, inflammation of the mucous membrane was the effect, and not the cause, of tuberculous deposition.

I have never seen tuberculous matter in the mucous membrane of the small intestine, or known it develop itself in this organ under any other form than that of granulations.

These two kinds of product existed, either separately or conjointly, in thirty-six of the ninety-five subjects referred to; and in six of them there were only hard semi-cartilaginous granulations. This variety consequently occurred with much less frequency than the other.

It is perfectly evident that the tuberculous and the semi-cartilaginous granulations are one and the same product in different stages of development; and this because they obeyed the same laws, were of the same size, and almost invariably occupied the same position. The semi-cartilaginous species was, no doubt, of recent origin at the period of death, whereas those of the other, being of older formation, were also less firm, having, in fact, more nearly reached the stage of softening. When both kinds coexisted in the same individual, those of the hard species were less numerous than when they were the only sort present.

Since the publication of the former edition of this work, the study of similar facts has led me to results of identically the same character. Among one hundred and twenty cases in which I took careful notes of the condition of the small intestine, I found fifty-four wherein tuberculous granulations, in greater or less number, appeared all over its surface, or more generally in

the ileum, around or at the bottom of ulcerations, and pretty frequently also in the intervals between these.

It is further worthy of note, that in several of these cases, very small gray semi-transparent granulations were found associated with the tuberculous granulations properly so called: an additional proof of the common origin of these two products, one of which is the first stage or one of the phases of development of the other.

Ulcerations were still more frequently met with than granulations of either kind,—a circumstance leading to the inference that they must often be produced independently of these bodies. I have observed them in greater or less number in seventy-eight individuals, that is, upwards of twice as frequently as granulations, and in about five sixths of the total number of cases.—This ratio is somewhat different from that announced by Bayle, who states that he met with them in the sixty-seven hundredths only of his cases. But this discrepancy should not create any doubt of the accuracy of the statements made by myself; for it is probable that I spent more time than Bayle in cleaning the surface of the bowel and in examining it scrupulously from one end to the other. In this manner the minutest ulceration, altogether imperceptible unless the intestine be thoroughly washed, did not escape me; and hence probably the difference in our results.

The justness of this explanation is proved by my subsequent experience; for among the one hundred and twenty additional cases, referred to a moment ago in connexion with the subject of tubercles of the small intestine, I found ninety-six cases of ulceration;—a proportion almost identically the same as that given above, and already stated in the former edition.

With few exceptions, the number, size, and depth of the ulcerations increased, the nearer the cæcum the examination was made. If we suppose the small intestine divided into three equal parts, there were none found in the majority of cases except in the third nearest the cæcum, or they coexisted in this and in the middle third; much less commonly did they pervade the whole length of the bowel. Still even this condition of things was not very rare; I observed it in a little more than the sixth part of the cases; whereas, in three instances only were the ulcerations limited to the middle third.

When of small dimensions, these ulcerations almost invariably presented themselves opposite the mesentery, in the situations once occupied by the glandular patches of Peyer, which were now imperceptible, having indeed been completely destroyed; when of the largest dimensions observed, they extended round the entire circumference of the bowel.

They varied in superficial extent from two lines to eighteen or twenty-two inches [4 millimeters to 45 or 55 centimeters]. In certain cases several ulcerations of these latter dimensions existed in the same subject, (Case IV;) whereas, in others a few only, or even but one, of the smaller kind were discernible. (Case XVI.)

Their shape generally indicated their mode of origin, and varied as their dimensions. When small, they were round, like those succeeding to the softening of granulations; when of medium size, they presented an elliptical form, like the glandular patches in which they originated; the latter was the most general shape; next in order came the annular. (Cases XXIX, XXXIV, LIV.) The linear was the most uncommon form; still I have observed it in seven cases, almost invariably in the upper half of the intestine: the ulceration, under these circumstances, measured from an inch and two lines to two inches [3 to 5 centimeters] in length, by one and a half to two lines [3 to 4 millimeters] in width at its central part; being at the same time narrower at both ends.

The colour of the ulcerations was not less varied than their other attributes. Generally whitish when they were of small size, it was often gray and red, when they were of medium or large dimensions. Sometimes also, but solely in the case of the long and narrow ulceration, their colour was blackish or reddish brown.

The structure of the ulceration varied with their extent and their length of duration. When small, and no doubt recently formed, the submucous cellular tissue was laid bare, somewhat thickened and smooth, and the muscular tunic not obviously altered in characters. When of larger size they exhibited a more varied aspect. The surface of some of them was uneven and formed of the submucous tissue, more or less thickened, and some shreds of mucous membrane. In others, no traces remained of the latter coat; the mucous membrane was alternately

thickened and attenuated, and destroyed in some points or even over the entire surface of the ulceration, and the submucous tissue laid bare. When thus exposed, the latter became in its turn more or less thick, was irregular on the surface, of grayish and whitish colour, and sometimes studded with tuberculous granulations; partial attenuation in other spots frequently coexisted with this thickening. In much rarer cases complete destruction of the muscular coat existed in some spots. As a general proposition, it may be stated, that as each additional tunic composing the walls of the intestine was laid bare, it first underwent thickening, and eventually ulcerated.

Very frequently the ulcerations were produced by the union of several of much smaller size;—a fact easily ascertained when they were numerous and seated on the glandular patches. Under these circumstances, softened tubercles and a greater or less number of small round ulcerations, separated by strips of membrane still perfect or partially destroyed, appeared in some of the patches. In others in the same individual the strips of mucous membrane had completely disappeared, the cellular membrane lay exposed over their entire surface, was more or less thickened, and exhibited rounded depressions of greater or less depth, doubtless indicative of the previous existence of small ulcerations. Lastly, in a third order of ulcerations of the same form, the sub-mucous tunic was destroyed in some points or through the entire extent of the ulcer, and the muscular membrane laid bare, rendered more or less uneven, and thickened.

In cases where ulcerations of the small intestines have penetrated thus deeply, the observer pretty frequently finds the corresponding portions of peritoneum (I have seen this sometimes, and M. Andral has described it very accurately,) injected, and covered with purulent exudation. Sometimes this inflammation even extends to another portion of the peritoneum belonging to a portion of intestine lying in contact with the ulcerated one. Under these circumstances, adhesions may form between the two portions, and eventually, if the ulcerations become perforative, the adhesions fortunately form a barrier which circumscribes the effusion.

The following case may be quoted here as exemplifying the greater number of the anatomical conditions just described.

Case IV. A house-painter, aged 62, was admitted on the 25th July, 1824, into the Hospital of La Charité, and died there the 1st of August following. Born of healthy parents, and of thin, spare habit, he stated himself to have been five months ill, during all of which he had suffered from diarrhœa. This had been very severe at its commencement, the patient having had twenty, or sometimes more stools in the twenty-four hours, frequently also attended with violent colic; cough commenced in the middle of the fourth month: from that time the voice was more or less completely lost, and a sensation of dryness came on in the larynx. The appetite had failed from the first, and the anorexia became subsequently complete; occasionally, from the commencement of the fourth month, the cough excited nausea. In the third, severe thirst set in; neither rigors, nor any uncomfortable amount of heat of skin had occurred, until the eight days preceding the patient's admission: loss of flesh from the outset.

July 25th. *Present state.* Considerable feebleness; memory perfect; respiration but little hurried; cough tolerably frequent; sputa rather abundant, opaque, greenish, non-striated, and ragged at the edges; percussion-sound clear; tracheal respiration under the left clavicle, harsh and strong under the right, without gurgling; no fever, skin cool, pulse quiet; tongue rather pale than red, almost in the natural state; complete anorexia, moderate degree of thirst, deglutition somewhat impeded, occasional oppression at the epigastrium; three liquid stools.

31st. Decomposition of the features, which are expressive of uneasiness and suffering; tongue dry; abdomen very hot, but natural in respect of form and size. For about the last hour the patient has suffered from sharp pain in the region of the gall-bladder, which is greatly increased by pressure; stools excessively frequent; pulse and respiration very much accelerated.

These symptoms continued the remainder of the day, and the patient expired the following morning, at four o'clock.

Sectio Cadaveris; *twenty-eight hours after death.*

External appearances. Marasmus in its last stage.

Head. Considerable serous infiltration under the upper part of the arachnoid; three table-spoonfuls of transparent serosity in each lateral ventricle, one in the inferior occipital fossæ.

Septum lucidum very thin, and distended by about a table-spoonful of serosity contained in the fifth ventricle.

Neck. The lower half of the laryngeal surface of the epiglottis somewhat red, presents some superficial ulcerations: there was one small one at the junction of the chordæ vocales. The mucous membrane of the trachea red, without other change.

Chest. Abundant cellular adhesions between the left lung and the diaphragmatic and costal pleuræ; the organ, congested at the base, contains at the apex a tuberculous cavity of medium size, almost completely empty, and with walls unlined with pseudo-membrane, and in great measure formed of tubercles, granulations, and gray matter, with a more or less strongly-marked blackish hue, which was also pretty freely spread through the rest of the superior lobe. These same changes—the only ones here present—were found to a limited extent in the lower lobe. On the right side the adhesions were few; the lung contained a few tubercles or granulations, but no cavity. On this side the bronchi were of a delicate pink colour; on the left, where they communicated freely with the cavity, they were of very deep red hue.—The bronchial glands were not tuberculous.—Heart healthy; aortic sygmoid valves tense and thickened at the free border.

Abdomen. A little reddish but transparent serosity in the lumbar regions; about a tumbler-glassful of thick, yellowish pus, free from smell, between the bladder and rectum; no trace of false membrane anywhere.—Mucous membrane of the stomach very thin, almost transparent, and as soft as mucus in the upper part of the fundus, when the subjacent vessels were of brownish colour, and appeared very large. Elsewhere the membrane was grayish, more or less largely mammillated, and of proper thickness and consistence.—Nothing remarkable in the duodenum.—Small intestine rather larger than natural, exhibiting externally a number of spots, of grayish blue colour, and containing a great quantity of turbid, reddish, and tolerably thick fluid. Supposing the entire tract divided into five equal parts, the mucous membrane was perfectly sound in the first and last; in the rest of its extent it exhibited a number of ulcerations running parallel to the valvulæ conniventes. The largest were seated in the middle part of the space referred to, extended quite round the intestine, while their fundus was formed

of the exposed muscular coat: two of these were from fourteen and a quarter to twenty-one inches and a half [36 to 54 centimeters] in superficial extent, of gray and reddish colour, and uneven surface. The corresponding muscular coat was nearly a line [2 millimeters] thick; its fibres stiffer and more fragile than natural. Above and below were other ulcerations, not comprising the entire circumference of the bowel, with thick edges, and a very thin central part; the thickness of these walls diminished from the periphery to the centre, and the muscular membrane was cut slantingly. The centre of several of these ulcerations was formed solely of peritoneum; this membrane was even perforated in two places: and, to the extent of from four to five lines [8 to 10 millimeters], round one of these perforations, it was of livid red colour, and of extreme tenuity, exactly as in cases of perforation occurring in the course of typhoid fever. The colour of the peritoneum surrounding the other perforation was natural; it was less attenuated too: so that I am inclined to regard the perforation rather as having been produced in the examination (notwithstanding all the precautions taken) than as otherwise caused.—The large intestine contained matter of the same kind as the small. The muscular coat was completely laid bare to the extent of eight inches and a half [21 centimeters] in the cæcum and commencement of the ascending colon, the ulceration extending all round the gut; its tissue was of grayish colour, partially destroyed in some places, and one line [2 millimeters] thick. Above this vast ulceration, and as far as the middle of the transverse colon, were other very large ulcerations, in all respects similar to the former, and having healthy mucous membrane between them. The mucous membrane was pale, and somewhat softened, in the descending colon and rectum. The greater number of the mesenteric glands were of large size, and transformed into tuberculous matter. Masses, of variable size, of a white and opaque, shining, hard matter, unquestionably of cancerous nature, were placed beside the tuberculous substance in some of them.—The remainder of the abdominal viscera natural.

In spite of the precautions used in the examination of the alimentary canal, and although the edges of one of the intestinal perforations resembled those of acute perforations, the nature

of which has been established in the clearest manner by symptoms and anatomical characters, still I cannot believe that this perforation existed during life. It is no doubt true that very severe pain manifested itself during the last twenty-four hours in the neighbourhood of the gall-bladder; that the pulse became very rapid and the abdomen burningly hot; that a certain quantity of pus was formed in the abdomen, and that there had been peritonitis. But, on the other hand, the pus was without smell, of the colour of the laudable variety of that fluid, and had none of the qualities of the effusion which takes place from perforation of the bowel, (qualities so clearly defined, in respect of smell and colour, that they are in themselves sufficient, independently of ulterior investigations, to render the existence of perforation almost a certainty): further, not the smallest quantity of such reddish turbid matter, as existed in the small intestine, was found in the abdomen. All this would lead to the opinion, which I am certainly disposed to adopt, that the peritonitis observed here was rather an example of that affection occurring spontaneously, as it sometimes does, at the close of phthisis, than of the perforative variety of that inflammation. Be this as it may, the case is one of great interest on account of the number and magnitude of the ulcerations in both divisions of the intestine, of the thickening of the muscular coat opposite them, of its attenuation in some places, and of its complete destruction in others,—the peritoneum being laid bare, and the intestine, if not perforated, at least on the point of being so.

It is to be remarked, that there were no tuberculous granulations in the substance of the muscular coat; and that if granulations were more common in this situation, destruction and perforation of its substance would be of less rare occurrence. But, as I have already said, the muscular fibres, instead of tending to undergo destruction, when the mucous and cellular coats have disappeared, gradually thicken, and it is only after a lapse of time, more or less considerable, that their destruction commences,—and even then its occurrence is but rare.

The circumference of the ulcerations—to return to the general history of these morbid changes—was sometimes perfectly flat; in the majority of instances, however, it was more or less prominent. When the ulcerations were small and round, the

mucous and cellular coats exhibited a very slight increase of thickness at their circumference; when the large ulcerations had not as yet reached very deep, and the submucous tunic was not destroyed, their circumference was uneven and more or less thickened,—a condition arising in many cases from the presence of softened tubercles. The mucous membrane, generally speaking, appeared red and softened around these solutions of continuity.

In addition to the morbid states so far described, minute abscesses, the size of a pea, were in some cases found developed in the substance of the submucous cellular tissue. These abscesses existed in cases where there were neither ulcerations nor tuberculous granulations in the small intestine. Sometimes their walls were smooth, so as to give them the appearance of being the consequence of phlegmonous inflammation, and not of the softening of a tubercle. However, it is to be observed, that I have scarcely met with these abscesses except in phthisical subjects; and that in the only two cases in which I found them in the bodies of persons cut off by other diseases, the matter they contained was very thin, yellowish, and semi-transparent.

When the small intestine was healthy, or but triflingly diseased, it contained mucus variable in quantity, colour, and consistence, sometimes stained with blood. But when the seat of large and numerous ulcerations, the bowel contained, instead of mucus, a turbid liquid, of variable consistence, and of dull or slightly grayish red colour,—in short, of very much the appearance described in the last case; it exhaled a strong smell, like that of animal matter in maceration. (Case XXII.)

Another point which deserves mention, respecting ulcerations of the small intestine, is that they pretty frequently entail marked contraction of the bowel around them. This contraction also sometimes gives rise to serious symptoms, which have been pointed out by Dr. Corbin.[1] Case LX, reported further on, is certainly one of the most remarkable which could be adduced in illustration of this point; for the symptoms of the intestinal stricture may be regarded as the earliest observed in the case,—they persisted for a very long period, and upon it immediately depended the fatal issue of the disease.

Several of the morbid changes now described—softening,

[1] Archives de Médicine.

thickening, and redness of the mucous membrane—are common to phthisical subjects and to those dying of all varieties of chronic disease and of acute affections. The others—I mean tuberculous granulations and ulcerations—are proper to phthisis. I have never observed tuberculous granulations except in this latter disease; and if it be not rigorously correct to say that ulcerations of the small intestine are met with exclusively in phthisis, they are, at least, so rare in other chronic maladies, that the proposition is almost true to the letter. Among eighty-five subjects cut off by various chronic affections, six only presented ulcerations in the small intestine. Three of these persons had tuberculous cavities or tubercles in the lungs; of the three others, one was a female whose main disease had been gastritis, the two remaining subjects had died of dysentery. In these three cases the ulcerations were at once small and few in number; so that if ulcerations of the small intestines, of all kinds, are not absolutely proper to phthisis, those of a certain superficial extent may, at least, with much correctness be said to be peculiar to that malady,—I of course speak here of chronic affections only, and set aside typhoid fever altogether.[1]

SECTION V.—THE LARGE INTESTINE.

The morbid changes observed in this part of the alimentary canal were the same in nature as those of the small intestine; I shall consequently only speak here of the peculiarities they present.

The entire tract of the mucous membrane of the colon was *red* in twenty-seven of the ninety-five subjects already referred to; in other words, in somewhat more than the fourth part of the cases; the redness was continuous from one end of the bowel to the other in fifteen cases,—interrupted from place to place in twelve: in the former the redness was generally very intense.

Except in three instances, this red discoloration coexisted with advanced softening of the mucous membrane,—so ad-

[1] In the former edition of this work I had set down the so-called semi-cartilaginous granulations among morbid changes common to phthisis and to other chronic maladies; but upon repeating the analysis of my cases I found that every individual exhibiting these granulations in the intestines had tubercles in the lungs. This circumstance explains the alteration introduced into this Section.

vanced, that the tissue was as soft and yielding as mucus, and, when removed, actually looked like that substance. The membrane was thickened in several of the cases in question, and ulcerated in the greater number.

Thickening existed in certain cases, wherein the membrane had retained its natural white colour; but it was then softened, and studded with a certain number of ulcerations.

It follows, then, from the last two paragraphs, that thickening of the mucous membrane of the large intestine was always associated with another change of structure,—this other being almost invariably softening.

Softening was, consequently, a condition of very frequent occurrence. Not only was it observed in cases where the mucous membrane was red, and more or less thickened, but also in some of those, where this had retained its natural colour and dimensions. In seventy-two cases it affected either the entire tract, or a considerable part only, of the intestine.

In a tolerably large number of cases, the mucous membrane, red and softened, had a mammillated aspect, more or less generally, (Case XI;) or it was destroyed from place to place in small patches, so as to exhibit an undulated appearance, occasionally discernible from one end to the other of the bowel. In two cases it was entirely destroyed to a superficial extent of twelve inches [30 centimeters]; and in both, this enormous destruction of substance would have escaped me, in consequence of the slightly pinkish tint of the submucous cellular membrane, had I not examined the parts very closely. In the situations where the mucous membrane had undergone destruction, the cellular coat did not exhibit any appreciable alteration in properties; and it appears likely that this destruction was of mechanical origin,—an effect of friction by the passing fæces;—a view rendered the more probable by the fact, that when the mucous membrane of the colon has undergone the greatest possible amount of softening, simply passing the back of a scalpel along its surface snffices to remove it altogether.

In the cases referred to, the cellular tissue was commonly opaque, and its thickness doubled, trebled, or quadrupled, (Case XI;) in some subjects, as already mentioned, it had a slightly pinkish tint, but, in the majority of instances, retained its natural whiteness.

It may be inquired, whether the cause of the softening we have been considering is always the same. When associated with redness and thickening, there can be no question of its being the result of inflammation. Such is very probably the case, too, when there is thickening without redness; for disappearance of the red hue of inflamed tissues takes place sooner or later,—witness the various tints of the hepatized lung. But when softening exists, without change of colour or thickness, is it still the effect of inflammation? Assuredly such origin is not impossible; nor, on the other hand, can it be admitted as incontestably the real one,—for several organs of the body are pretty frequently softened, under circumstances wherein it would be impossible to regard this condition as arising from inflammation. Thus, in typhoid fever, and in several cases of chronic disease, the heart is often softened, and the cause of the change perfectly unassignable; the spleen, again, is, under a multitude of circumstances, the seat of extreme softening, which cannot be considered inflammatory. On the other hand, it is certain that we frequently find a softened portion of mucous membrane, free from red discoloration, continuous with another both red and softened, and it is probable, if the latter be inflammatory, the former is so likewise;—but this is a mere probability. Additional facts appear to me to be required for the solution of the question.

I am not aware of the existence of any facts satisfactorily showing at what degree of advancement this softening entails disorganization of tissue. It appears to me, however, exceedingly probable, that it may be carried very far, without such effect; the state of the spleen, in typhoid fever, lends support to this opinion. Thus, in a certain number of subjects dying of this disease, where it has run a protracted course, the spleen is large and firm; and as softening of this viscus is a phenomenon of almost constant occurrence during the progress of the affection, and is sometimes carried to extremes, it must be admitted that in some of those cases where the organ is found firm, it had at one period been soft,—in other words, that a retrograde movement had taken place in the morbid action, and, consequently, that disorganization had not taken place.

By and by, when engaged with the Semeiology of the disease, we shall see, as already mentioned, that inflammation leading

to pulpy softening of the mucous membrane of the large intestine, very frequently originates during the closing days of life,—just in the same manner as that of the parenchyma of the lung, the pleuræ, and the mucous membrane of the stomach.

Tuberculous granulations were present in thirteen cases, or in about the eighth part of the whole number,—seated in the middle, or on the edges, of the ulcerations, never in the spaces between them.

The paucity of cases of tuberculous development in the large intestine, becomes remarkable, when considered in connexion with the frequency of that development in the small intestine. The difference cannot be regarded merely as accidental, for, among one hundred and twenty cases of phthisis, observed since the publication of the former edition of this work, in all of which the state of the large intestine is carefully described, I only found eight examples of tuberculization ;—a still smaller proportion than that ascertained from my former series of facts. The difference now pointed out is the more difficult of comprehension, as ulcerations of the large intestine are almost as common as those of the small ; and it demonstrates, like other facts previously described, that the presence of tubercles, is far from being the sole cause of intestinal ulceration.

Ulcerations, as I have just said, were of frequent occurrence, —almost as much so as in the small intestine : seventy individuals presented these ulcerations. Now, as softening of the mucous membrane existed in several instances when there was no ulceration, it is easily inferrible that I must very rarely, indeed, have found the membrane perfectly sound throughout its entire extent. I, in truth, found it so in three cases only.

Generally speaking, these ulcerations were of small size, from three to six lines [6 to 12 millimeters] in diameter, sometimes less : those of larger size (and we have already seen that their dimensions were sometimes enormous) existed in only a fourth part of the cases. Those of the small variety were, in ten cases, almost uniformly distributed over the entire tract of the intestine ; when belonging to the larger variety (which includes those of a superficial extent, varying from about three inches and seven lines to seven inches and two lines [9 to 18 centimeters], or something more,) this uniformity of distribution was observed in but one case. In the others, the number of ulcerations di-

minished successively in the cæcum, the ascending colon, the transverse colon, and the rectum,in the proportions of 17, 11, 8, 4. If next, in order to ascertain the sum of cases in which there were ulcerations in each part of the intestines, I add to these numbers those of ulcerations of the small variety, we shall leave for the cæcum, the ascending, the transverse, and the descending colon, and the rectum 34, 37, 25, 8, 32 cases of ulceration,—hence the number of individuals affected with this species of morbid change in the rectum and in the cæcum was pretty much the same; but here the analogy between those two parts of the intestine ceased in respect of ulceration; the difference was extreme between them, in regard of the size and number of ulcerations.

When of small size these solutions of continuity were pretty commonly of rounded shape, and provided with flat edges, so that they appeared as if cut out with a punch: their fundus was grayish or blackish, more rarely of a pale pink colour; in the latter case they must frequently have escaped notice, had it not been for my invariable habit of carefully washing the bowel. The fundus was composed of the submucous tunic, thickened or reduced to a lamina of extreme tenuity,—sometimes (in three cases only) by the muscular tunic unchanged in character,—a condition which I did not observe in any instance of ulceration of the small intestine.

Instead of being round, the small ulcerations, and those of medium size, were occasionally much elongated, measuring from above one inch and two lines, to two inches and four lines [3 to 6 centimeters] in length, by two to three lines [4 to 6 millimeters] or less, in width; they ran under these circumstances, in a transverse, longitudinal, or oblique direction. These different forms sometimes coexisted; and when the ulcerations were numerous, and closely set, and the intervening mucous membrane more or less thickened, the intestine had exactly the appearance, except in point of size, of a hand covered with large chaps.

Ulcerations of the large class were of more or less irregular, denticulated, or stellate appearance; and implicated, in several cases, the entire circumference of the cæcum, ascending and transverse colon, and of the rectum. Not only did they thus pretty frequently encircle the cæcum, or ascending colon, but the same ulcerations often extended from one end to the other

of those divisions of the bowel, or nearly so, measuring for example, about nine inches and four lines [24 centimeters] and upwards in length. (Cases IV, XX.) In some cases there appeared in the midst of these vast ulcerations a band of intestine, perfectly sound, with the exception of slight softening of its mucous membrane; or there were discernible, here and there, islets, formed of detritus of the mucous and cellular coats, united, and more or less thickened.—In no case did the other parts of the intestine exhibit such enormous breaches of surface. The most extensive I have met with in the rectum measured from one and three quarters to two inches [4 to 5 centimeters] in length, extended entirely round the bowel, and were placed immediately above the anus.

The large ulcerations and those of medium dimensions were of grayish colour, and the surface of those belonging to the latter class sometimes formed of the submucous cellular tissue, thickened, hard, and brittle. In two instances only did I find this tissue much softened: it had generally been destroyed, so as to lay bare the muscular coat. In the situation of the large ulcerations, this destruction was almost invariably complete and universal: thus laid bare, the muscular membrane was of a more or less deep gray colour, and always thickened, to the amount of upwards of one line [2 millimeters] in some cases. The muscular fibres were hard and brittle, formed prominent bundles (separated in certain cases by tuberculous granulations) and exhibited in some points traces of incipient destruction.

Sometimes both mucous and submucous cellular coats together were separated from their attachments to a greater or less extent, at the circumference of the ulcerations; or they formed bands of variable width, thrown between them like bridges.

When the ulcerations were large and numerous, and the muscular membrane laid bare to a considerable extent, they frequently exhaled a fetid odour, resembling that of animal matter in maceration; and the fæces were reddish coloured, turbid and fluid, or sometimes of the colour of putty. It occasionally happened, too, that the fæces, voided during the last days of existence, presented these characters, and exhaled the odour mentioned. Were the ulcerations in small number, of medium size, and limited to the cæcum, or the commencement of the

colon, for example, the fæces were pretty frequently soft, dirty coloured, and sometimes tinged with blood in those parts; whereas they were blackish, and of a fine yellow colour in the rectum: whence the conclusion that, in rare cases only, can we draw inferences as to the state of the mucous membrane of the large intestine, from the characters of the fæces.

Intestinal ulceration was frequently independent, at least at the outset, of inflammation as its cause: this is perfectly evident, in the case of the small intestine, in a great number of subjects, where the ulcerative process followed softening of tubercle. The development of this product cannot be ascribed to inflammation of the mucous membrane, for this remained unaffected beside the new formations, so long as they had not softened; far from being its cause, inflammation of the membrane was in reality, as has already been seen, the effect of the presence of the granulations. The same observations are applicable to certain cases of ulceration of the large intestine; and even in those instances in which it is impossible to attribute the ulcerations to softening of tubercles, much difficulty attends the hypothesis of their being the effect—at least the sole effect—of inflammation, inasmuch as inflammation does not commonly attack the intestines in isolated patches or spots. I have, I think, demonstrated this, (when speaking of softening of the mucous membrane, accompanied with red discoloration and thickening,) by making it clear that this change almost always implicated the greater part of the extent of the bowel; and as regards the small intestine, I may observe that, although inflammation is of much less frequent occurrence there than in the colon, ulceration is even still more common in the former than in the latter situation; and were it thought correct to ascribe the ulcerations to inflammation, this inflammation must at least be regarded as of special character, because, in the majority of cases, it implicates the glandular patches of Peyer.

These views derive corroboration from what I have said respecting the extreme rarity of ulcerations of the small intestine in the course of any chronic affection, except phthisis; for mere inflammation of the mucous membrane is not less frequent in other chronic maladies than in phthisis.

M. Andral inquires how the common notion of the great

frequency of fistula in ano, in phthisical subjects, can have gained ground, since he himself met with that affection in but one of about eight hundred subjects labouring under tuberculous diseases in various stages.[1] Nor have I been more successful than M. Andral; and I can readily account for the common error on the subject of fistula in ano, in phthisical subjects, by the habit still adopted by many medical men, of making analyses of their cases, by the aid of memory,—that is of attempting impossibilities—and of obstinately refusing to count, in cases where, it is obvious, that process cannot be dispensed with.

Subsequently to the appearance of the first edition of these 'Researches,' ulcerations of the large intestine have presented themselves to my notice, at the hospitals, both of La Charité and of La Pitié, even in a still higher proportion than that just now stated; among one hundred and eight cases there were only twenty in which that description of alteration was undiscoverable.

With the exception of tuberculous granulations, I have observed, though in very different proportions, every morbid state of the larger intestine, just reviewed, in the subjects of other chronic affections, besides phthisis. Thus, of ninety-two individuals, cut off by some one or other of those maladies, thirteen had a greater or less number of ulcerations in one or more parts of the large intestine. But six of these persons had tubercles in the lungs, and were, consequently, phthisical,—which reduces the number of cases to seven among eighty-six: of these seven cases four were of dysentery; and in almost all of them the ulcerations were small, and somewhat different in their characters from those previously pointed out.—Softening, with or without redness, or thickening of the mucous membrane, existed in one third part of the cases, consequently much less frequently than in phthisis.

[1] Clinique Médicale, Paris, 4ème éd. t. iv, p. 308.

CHAPTER IV.

LYMPHATIC GLANDS.

The lymphatic glands were frequently found tuberculous, and sometimes, also, more or less red and enlarged, but very seldom the seat of any other alteration. I shall examine them in the different regions of the body, commencing with those of the neck.

SECTION I.—CERVICAL GLANDS.

The cervical glands were more or less extensively tuberculous in the tenth part of the cases, or in eight of eighty individuals. Associated with this tuberculous disease of the glands, I found more or less deep red discoloration in the parts, free from tuberculous transformation; their size was greater than natural. (Cases IX, XII, XL, XLV.) The tuberculous matter was deposited in spots or patches, of variable size, but of no determinable shape; in no instance did it exhibit itself under the form of opaque or gray semi-transparent granulations. Complete transformation of a gland was a rare phenomenon, and in no instance had softening of the tuberculous matter advanced far.

In one case, observed at a late period, and which will be again referred to, in connexion with the subject of acute phthisis, I found a certain quantity of gray semi-transparent matter seated in one of the cervical glands.

In four of the subjects just referred to, the mucous membrane of the trachea was coloured of a more or less bright red, and was, in one instance, the seat even of a few small ulcerations: in the others it was perfectly sound; and in no case where this membrane presented the huge ulcerations before described (Cases XXIII, XXXIV), were there any of the cervical glands tuberculous. So that here, as we shall find to be the

fact in several cases of mesenteric tubercles, the tuberculous transformation is ascribable to some other cases than inflammation of the mucous membrane, to which the glands correspond.

In one case only were the tuberculized cervical glands the seat of pain; the patient in this case, likewise, supplied the sole example, of which I have taken note, of development of tubercles in the axillary glands. She suffered the same pain here as in the neck.

I have not myself seen any instance of compression of the cervical vessels by tuberculized glands; but a case of the kind has been witnessed, by M. Tonnelé, in a child. The vena cava superior was here pressed upon, near its division, by a tuberculous tumour, around which the vessel coiled; the pressure determined stasis of blood in the jugular veins, and even in the sinuses of the brain.[1]

SECTION II.—BRONCHIAL GLANDS.

Although I scarcely made any mention of the bronchial glands in my former edition, these bodies very frequently undergo tuberculous transformation,—not only in children, in whom all accurate observers coincide in regarding the transformation of these organs as even more frequent than that of the lungs, but also after the age of fifteen in those of adult years. Since 1825 I have examined the bronchial glands with attention in seventy phthisical adults, and found them tuberculous, to various amounts, in twenty [?] or in about one half of these cases; whereas, in the same number of persons, the mesenteric glands were tuberculized in twenty-three cases, and the cervical in twenty-one.

The frequent presence of tubercles in the bronchial glands, is not the only circumstance worthy of attracting the observer's attention to these structures. The situation of the glands in the neighbourhood of the large vessels, of the bronchi, of the œsophagus, and of the trachea, is especially worthy of remark; for from the fact of such locality may result—as has actually been witnessed in the case of children—compression of all those

[1] Journal Hebdomadaire de Médecine. Paris, 1829, t. v, p. 150.

parts, and consequently, difficulty of breathing, and of swallowing, impeded circulation, and even fatal hemorrhage.

The bronchial glands, when tuberculized in the adult, are of more or less considerable size, though smaller than in infancy, at which period compression of the trachea and bronchi is, as we shall presently see, a far from rare effect of their enlargement. When thus increased in size, the bronchial glands, unlike those of other parts of the body, exhibit no red discoloration in the spots not filled with tuberculous matter; far from this, they are of grayish and blackish colour, and generally speaking of firm consistence, and in some cases contain a hard matter, like cretaceous, stony, or osseous substance. The glands thus affected are sometimes, as noticed by M. Andral, of small size, and as it were shrunken; and they are commonly found in this state, according to the same observer, in individuals whose lungs also present appearances of an analogous character, or an incipient condition of cicatrization,—circumstances favouring the belief that they themselves are in the progress of cure. The course of the glandular affection is very variable, and occasionally extremely rapid. Rapidity of course is proved by the discovery of the traces of the affection in individuals, cut off by phthisis in less than two months; for, as we shall hereafter see, the notion that the bronchial disease can have originated—at least in the adult—before that of the lungs, is inadmissible.

The interesting investigations of MM. Rilliet and Barthez, to whom I am indebted for the following details,[1] have shown that, in children, the bronchial glands are generally invested with a thin-walled cyst, to which the tuberculous matter closely adheres. At a certain period the cysts themselves become adherent to the parts with which they are in contact,—much more frequently, however, to the bronchi than the lungs or vessels, doubtless, in consequence of the slight resistance set up by these latter parts. After these adhesions have been effected, softening of the tuberculous matter they contain generally follows next in order, and eventually a communication is established between the glandular cyst and the interior of the bronchi. The cyst, hitherto composed of a simple membrane, is found to be lined with a red false membrane, of some thick-

[1] Arch. de Méd. t. vii, 1840; t. xv. p. 448, 1842.

ness and so intimately united, according to these observers, to the mucous coat of the bronchi, that their line of union cannot be determined.

Among the twenty-six cases upon which their 'Essay' is founded, MM. Rilliet and Barthez found eighteen in which a tuberculous cyst communicated with the bronchi or the parenchyma of the lung; the communication existed twelve times on the right and five times on the left side,—a difference attributed by them to the greater caliber of the right bronchus and the greater number of the glands surrounding it. Communication of the cyst with the bronchi was much more frequent than with the substance of the lung, in the proportion of fifteen to three. In one instance MM. Barthez and Rilliet met with pneumothorax (unattended, however, with its ordinary symptoms) produced by rupture of the cyst; and M. Berton, in a 'Prize Essay' presented to the Société d'Emulation, has recorded an example of perforation of the pulmonary artery determined in the same manner.[1]

SECTION III.—MESENTERIC GLANDS.

These glands were tuberculous in twenty-three of one hundred and two subjects in whom I examined them with care. When thus diseased, they were likewise enlarged. In the majority of the cases the transformation did not implicate the entire gland, (Cases IX, XXIII, XXIV, LIV;) in some instances a few miliary spots in the centre, or towards the periphery of the gland, constituted the whole amount of tuberculous change. These spots were scattered through the glandular tissue,—itself, generally speaking, redder and less consistent than natural; in the majority of cases they were collected into little groups.

The glands of the mesentery were not all of them affected in this manner with the same degree of frequency. Those nearest the cæcum suffered oftenest; and among the twenty-three cases, one only supplied an example of tuberculization of the whole mass of glands. (Case XVI.) In this instance the transformation of each gland in particular was complete, and no traces remained of its original structure.

[1] Traité pratique des Maladies des Enfans. Paris, 1842, p. 526.

It is evident that in this case there was not only production of a new tissue, but transformation of one tissue into another, unless we prefer admitting that the structure of the gland had, at least in part, been destroyed by absorption.

In one case I found a small quantity of gray semi-transparent matter in the midst of a partially tuberculized mesenteric gland. In all other cases the granulations discovered, even when miliary, were yellowish, opaque, aud actually tuberculous. The development of tuberculous matter consequently followed in these organs a somewhat different course from that assigned it by Laennec in the lungs.

The mesenteric glands, when tuberculous, were not affected with any other mode of organic alteration. In one instance only I found, in juxta-position with tuberculous matter, a shining, firm, granular substance closely analogous to cerebriform cancer.

The mesenteric tubercles I met with had very rarely undergone softening,—no doubt in consequence of the recency of their development. At least this is the probable explanation of the fact, inasmuch as, in the majority of cases, the production of tuberculous matter in the mesenteric glands is gradual and partial, consequently still recent at the period of death,—and inasmuch as softening only sets in when the tuberculous transformation affects the entire gland.

With respect to the cause of tuberculization of these glands, it may be observed that when thus diseased, their size was greater, as has already been stated, than natural. When a few spots only of tuberculous character constituted the full amount of that disease present, the glandular tissue appeared of a more or less bright red colour, and was often a little softened; but in some cases, although slightly enlarged, the glands had not manifestly undergone any change in colour or consistence. Inflammation would appear thus to have had some influence on the development of the tuberculous matter in a certain number of instances; while in others, fewer in number it is true, no such influence appears traceable.

But, whatever may have been the immediate cause of the production of these tubercles, a further point requires elucidation in respect of their etiology—namely, whether they were invariably connected with inflammation of the mucous mem-

brane corresponding to the glands. In every case where the mesenteric glands were tuberculous, I found ulcerations in the small intestine,—ulcerations which had not formed without primary or consecutive inflammation of the mucous membrane, and were themselves a perpetual source of irritation. When the tuberculous transformation was limited to a part of the mesentery, this was the portion nearest the cæcum,—that corresponding, generally speaking, to the large class of ulcerations. All this appears to indicate a close connexion between mesenteric tubercles, the various conditions of the mucous membrane, and ulcerations of the small intestine. But in more than half the cases the ulcerations were small, and when very large and consequently of old standing, the quantity of tuberculous matter was not greater in consequence. The only case in which I found all the mesenteric glands completely transformed into tuberculous matter was that of a young man, in whom the disease was still recent, who had had very little diarrhœa, and in whom the mucous membrane of the small intestine exhibited the characters of perfect health in respect of colour, consistence, and thickness. (Case XVI.) The only morbid appearance discoverable in the membrane (and doubtless much importance will not be attached to this in respect of the point under consideration) was a rounded ulceration, of one line [2 millimeters] in diameter, with pale and flat edges, and seated in the neighbourhood of the cæcum. From all this we must conclude that, if inflammation of the lymphatic glands, and inflammation and ulceration of the corresponding portion of the mucous membrane of the small intestine should be regarded as the exciting cause of mesenteric tubercles in certain cases, there are others in which these products acknowledge no such causation.

It may perhaps be urged, in respect of the case just referred to, that the tuberculous affection was here of chronic nature, —that the mesenteric disease had originated earlier than the pulmonary; and that, consequently, the inflammation of the mucous membrane, to which the glandular alterations were really ascribable, might have disappeared. But this mode of arguing would be nothing more than meeting a fact by an hypothesis, and assuming as constant that which is by no means so, I mean slowness of evolution of tuberculous matter,—on the contrary, as we shall find when engaged with the subject of the Progress of phthisis, that morbid product is sometimes developed

with extreme rapidity. I may add, by anticipation, that I have not met with mesenteric tubercles except in phthisical subjects, and that, were it only for this reason, I cannot imagine their having been developed in the case before us earlier than the main disease. Another circumstance to be noted is, that at no period were there signs of very marked irritation of the mucous membrane of the small intestine.

The duration of the principal disease had no influence in either direction on the mesenteric affection. I have observed this as frequently in subjects whose pulmonary disease was of recent origin—having lasted from a month and a half to five months, for example—as in others who had suffered from it during a period of from one to ten years.

When not tuberculous, the mesenteric glands were still pretty frequently of considerable size, and coloured of a more or less bright red. Here we have a motive for admitting that, where tuberculous matter and inflammatory changes coexisted, the latter had preceded the former in development.

I have not noted any symptoms referrible to the diseased state of these glands. In the case already mentioned of complete tuberculization of them all, the patient had had no pain in the umbilical region; nor was any tumour discoverable there by pressure. However, if the presence of tumour in the mesentery were established in the case of a phthisical subject, that tumour should be regarded as tuberculous, for in no case of the kind have I found a tumour of any other description in this situation.

SECTION IV.—MESO-CÆCAL, MESO-COLIC, AND LUMBAR GLANDS.

The meso-cæcal glands were somewhat less often tuberculous than those of the mesentery, and more frequently than those of the right lumbar meso-colon. When thus affected, like the mesenteric glands, they were more or less increased in bulk, rarely transformed throughout their entire substance into tuberculous matter, and exhibited a state of red discoloration in parts free from that matter.

In five of sixty subjects I found the lumbar glands transformed into tubercle. In three instances the transformation was complete, and the glands enlarged to the size of a walnut,

firm, and displaying no appearance of softening in any part. In one of these the mucous membrane of the small intestine and of the colon was perfectly healthy; nor was there any morbid state of the abdominal viscera capable of explaining the existence of the glandular disease. The subject of this case was a female, aged seventy.

In none of these cases could I detect gray granulations associated with ordinary tuberculous matter; so that the development of the latter was here accomplished in the same manner as in the mesenteric glands.—In one instance only I found the glands of the right lumbar meso-colon converted into tuberculous matter.

These anatomical changes appear proper to phthisis, at least in the adult; for among ninety-eight individuals cut off by chronic diseases of various kinds, dysentery, &c. there did not occur a single example of tuberculized lymphatic glands. Nevertheless, inflammation of the intestinal mucous membrane, sometimes even ulceration, &c., existed in a tolerably large number of them,—whence, an additional motive for believing that inflammation of the mucous membranes is neither the sole cause of, nor even the most important condition for, tuberculous transformation of their corresponding lymphatic glands.

M. Andral relates a case which appears to furnish an exception to the general law deducible from the facts just analysed; and although this be only a single case, I think it well to observe that it is not so conclusive as might be supposed on first consideration. It is quite true that the lungs were in this case, according to the statement of M. Andral, *perfectly healthy;* but he adds not a word to this simple statement, and when details upon a point of such importance are completely wanting, it is fair to doubt whether the lungs were really as healthy as the celebrated Professor affirms;—may not the examination of those organs have been somewhat superficial, and a few granulations, as frequently happens, escaped observation during their rapid survey? And these doubts are the more allowable as the intestines of this patient were agglutinated by false membrane into a single mass; for here was evidence of chronic peritonitis, and chronic peritonitis, as we shall hereafter see, is peculiar to phthisical subjects.

CHAPTER V.

BILIARY ORGANS.

SECTION I.—LIVER.

Fatty transformation of the liver ranks as the most frequent and most remarkable anatomical change of this viscus. It existed in a third part of the cases, or in forty of one hundred and twenty. When thus diseased, the liver was pale, almost always of a fawn colour of variable delicacy, and studded with red points externally and internally. The usual shape of the organ was retained, but its size almost invariably increased, sometimes even to nearly twice the natural amount,—an enlargement principally implicating the right lobe. Under these circumstances the liver overlapped a great part of the anterior surface of the stomach, filled the epigastrium, protruded two or three fingers' breadth below the false ribs, reached in some subjects the crista of the ileum inferiorly, and on the left side the spleen,—sometimes even passing beyond that organ. In one case I found it seated in the middle of the abdomen and about two inches and five lines [6 centimeters] distant from the pubis.

Its consistence, unless in a few cases where the morbid change was unadvanced, had fallen considerably below the natural standard; the tissue was easily broken down, and in some cases very soft. In cases where the transformation was far advanced, the tissue greased the knife and the hands like ordinary fat; when less advanced the nature of the change was ascertainable by placing a small slice of the liver on a sheet of paper and exposing this to the flame of a taper;—a slight degree of heat melted a small quantity of fat, this then stained the paper, and thereby disclosed its own presence.—This morbid condition invariably implicated the entire of the viscus.

The causes of fatty transformation of the liver appear to me as obscure as those of other organic diseases. Without aiming, then, at the solution of this problem, I shall state the principal

circumstances under which the transformation in question is effected.

The first point to be remarked is, that fatty transformation of the liver is almost exclusively observed in persons affected with phthisis; so that it may, to a certain extent, be considered a dependence upon that disease. Among two hundred and thirty individuals destroyed by acute or chronic diseases, other than phthisis, and in about equal numbers, nine examples of fatty liver were only to be found; and of these nine persons, seven had a certain number of tubercles in the lungs. Adding these nine to the forty others, we have forty-nine cases of fatty liver, the only ones I have collected in the space of three [?] years, and of these forty-seven occurred in phthisical subjects. Assuredly there are few phenomena, among those universally admitted to be reciprocally dependent, to the connexion of which facts bear more unanimous testimony.

Sex, again, is one of the conditions influencing fatty transformation of the liver. Of the forty-nine cases referred to, ten only were supplied by males; so that the proportion of fatty livers in men and women was very closely as 1 : 4. It is true that phthisis itself was a little more frequent among the latter than the former, in the proportion of 66 : 57; but this difference is not sufficiently great to alter the proportion mentioned very materially, and my statement remains correct.

Strength or weakness of constitution had no influence on the morbid state under consideration; and the same is true of age. Of the forty phthisical subjects referred to eighteen were aged from twenty to thirty; thirteen, from thirty to forty; five, from forty to fifty; three, from fifty to sixty; and one, from sixty to seventy;—a proportion very much the same as that of phthisis itself, at the different periods of life.

Nor do I reckon among the causes favouring the development of a fatty state of the liver, diseases of the duodenum; for these diseases were rare, and quite as much so in subjects whose livers had undergone the change in question, as in those in whom it was perfectly healthy.

Fatty transformation of the liver may be very rapidly accomplished: I have observed it in cases of phthisis, which had gone through all their stages in fifty days. (Case XLI.) The rapidity of progress of the tuberculous affection did not even

sensibly affect the proportion of cases of fatty liver; that proportion was the same in cases where the disease had lasted only a few months, as in those where it had run a course of several years.

If, however, I thus admit that the progress of fatty transformation may be of the acute or chronic type, I do so, guided solely by the dependence which exists between this morbid state and phthisis; for there are no signs or symptoms capable of disclosing its existence at any period of its course. In vain have I been on the watch for symptoms referrible to it,—I could discover none. The patients suffered from no pain in the right hypochondrium; pressure on the liver, when it protruded beyond the edges of the ribs, produced no distress; and if uneasiness were thus produced at the epigastrium, in cases where the liver extended into that region, the unusual occurrence was explained by the state of the mucous membrane of the stomach. In one case the colour of the skin was changed. (Case LIII.) The patient in this instance was a female, aged thirty, in whom the course of the pulmonary affection was at once obscure, and very slow. This woman had lived in England for some years, and during the progress of the principal malady suffered from prodding pains in the right hypochondrium, and some other symptoms, which led to the suspicion of disease of the liver. The affection was treated with purgatives and calomel; the colour of the skin gradually changed, and when I saw the patient, it exhibited a slightly yellow tint, except in the face, where an irregularly disseminated bistre colour prevailed: the sclerotic membrane of either eye retained its natural whiteness, —a circumstance which, as I shall hereafter show, throws some doubt upon the presumed cause of the cutaneous discoloration.

Under this absence of proper symptoms, there was only one phenomenon capable of making the state of the liver a matter of suspicion: I mean the enlargement of the organ, which almost invariably exists under the circumstances in question.

The liver, when affected with fatty disease, did not exhibit any other kind of organic alteration. Under all circumstances, indeed, the viscus was very rarely the seat of any organic change, except the fatty. In two cases only did it contain tuberculous matter. (Case IX.) In two young persons, of

eighteen and nineteen years of age, the internal substance of the organs contained a pretty considerable number of small cysts, varying in diameter from one to three lines [2 to 6 millimeters], of such slight consistence that they could not be separated from the surrounding parts, to which they adhered by no means closely, unless by using much precaution. They were about half a line [1 millimeter] thick, and contained a greenish, pulpy matter. I have met with this kind of cyst in no other organ than the liver, and in none but phthisical subjects.

In another individual (a woman aged twenty-nine years) the middle lobe was destroyed, and its place occupied by a fibrous cyst, of irregularly rounded form, and about double as large as the lobe itself,—its involucrum was only half a line [1 millimeter] thick,— in some parts even much less than this. The cyst, of yellowish white colour, contained a colourless fluid, slightly turbid and of moderate density, in the midst of which floated about a hundred small bodies,—free, of soft consistence and rounded form, varying in size from that of a hemp-seed to that of a small cherry. These little bodies (hydatids) were formed of a thin membrane containing a transparent fluid, and the cyst itself was lined through its entire extent by a white opaque membrane, of the same amount of firmness as boiled white of egg, varying in thickness from half to three quarters of a line [1 to $1\frac{1}{2}$ millimeters] very slightly adherent to the surrounding parts, and indeed rather placed in simple juxtaposition with these than otherwise, smooth and polished like a serous membrane on its adherent surface, dull-looking on its internal surface. The latter presented five elongated processes, varying from three inches and seven lines to nearly five inches [9 to 12 centimeters], and from one to two lines [2 to 4 millimeters] in thickness, uneven, and tuberculated on the surface, and exhibiting the appearance of concrete albumen on the surface of a cracked egg. The parenchyma, upon which the cyst lay, presented no alteration of structure of any kind.

The consistence of the liver varied much; either softer or firmer than in the natural state, it occasionally united to a certain degree of hardness a remarkable friability: in no case had symptoms existed referrible to this mode of alteration.

One of the subjects, whose case is elsewhere related, (Case VII,) supplied an example (the only one I had at that time seen)

of an emphysematous condition of the liver; the organ was lighter than the lungs, and scarcely as large as natural.

All that I have above said upon fatty transformation of the liver is confirmed by my further experience of fifteen years. To refer only to the cases observed at the Hospital of La Charité after the publication of my work, I may mention that the liver was fatty in thirteen of fifty-four individuals; these thirteen persons were females, of whom there were altogether thirty. The same number of cases supplied six of hepatic tubercles, and in none of these had the liver undergone the fatty transformation.

Considered in connexion with these facts, the fatty state of the heart observed by M. Bizot is well worthy of attention. On the one hand, that condition of the heart scarcely existed in any other than phthisical subjects, being in a perfectly rudimentary form in those who had fallen victims to affections of other kinds; and on the other it was found in females only. Hence phthisis, a disease which so completely dries up the tissues, constitutes, notwithstanding, the most essential condition for the fatty transformation of certain organs; and hence, further, the female sex is specially favorable to its occurrence.

The sort of incompatability which exists between the fatty state of the liver and the tuberculous development sometimes observed in the organ, brings to our recollection a fact recorded by Dr. Raynaud in his Essay, already quoted, on 'Phthisis in the Quadrumana.' The fact I refer to is, that the liver, which he so frequently found tuberculous, never exhibited fatty transformation in those animals; a motive for believing, he adds, that such fatty disease, almost exclusively connected as it is with phthisis in the human subject, is nevertheless not tuberculous in nature.[1]

[1] Mr. Bowman, of London, has made known the interesting fact (Lancet, January 1842,) that the liver contains a little fat in the natural state, which would lead us to regard the fatty state of the organ as nothing more than a kind of hypertrophy. I am, however, unaware whether the lungs of the subjects whose livers were examined by Mr. Bowman, were attentively inspected, and found completely free from tubercles; this is a point of importance, and one which must necessarily be ascertained before we can form an opinion concerning the real signification of the fact established by the English observer.

SECTION II.—BILE AND VESICULA FELLIS.

In one third part of the subjects affected with fatty transformation of the liver, the bile contained in the gall-bladder was of blackish colour, of sticky feel and consistence like treacle, did not flow like a liquid, and, in fact, had a sort of medium character between a solid and a fluid. In another third part of these cases its was still very thick, but less so than in the other; while in the remaining cases its colour and consistence were natural. Generally speaking, its abundance and thickness were in the inverse ratio of each other.

However, such an amount of thickening of the bile as gives it, on first view, some similarity to treacle, is not peculiar to phthisical persons with fatty livers. It is also met with under other conditions of this viscus, but in much smaller proportion. Thus in three phthisical subjects, whose livers were healthy, the bile exhibited this degree of consistence; and I have remarked it also in subjects dying of other chronic diseases, with a natural condition of the liver,—in five out of seventy individuals the bile was semi-solid like treacle.

No connexion could be traced between the state of the bile and that of the stomach. The bile was extremely thick under the most various conditions of this organ,—when its mucous membrane was softened, attenuated, inflamed, or in the natural state;—in subjects who still enjoyed some share of appetite to the very close of life, and in others who had lost it completely long before death; in those who had suffered from vomiting, for different lengths of time, and in others who had been perfectly free from that symptom.

These observations refer to the bile contained in the gall-bladder; that in the ductus communis choledochus did not appear to me altered in properties.

The *parietes* of the gall-bladder were rarely the seat of any alteration. I twice found them thickened, in consequence of infiltration with serosity; and in two other cases thickened from a different cause. In one of the latter instances (Case XLVIII,) the fundus of the gall-bladder adhered to the abdominal parietes, and here the mucous membrane was destroyed to a superficial

extent of about one inch and two lines [3 centimeters]. Near the neck destruction, similar in kind but less in amount, was visible, where the membrane was a quarter of a line [half a millimeter] thick, and exhibited on a small scale the aspect of a columnar bladder. The submucous cellular membrane had undergone similar thickening; in the situation of the ulcerations it was brittle; the gall-bladder contained about two hundred calculi, the largest of which equalled a pea in size, the smallest a millet-seed. Two years before death, the patient had had severe pain in the region of the gall-bladder, and attacks of jaundice frequently recurring during a period of eleven months.

In three females, aged thirty, thirty-four, and sixty years, the gall-bladder, exhibiting no diseased change in its coats, contained a considerable number of calculi, in the midst of a great quantity of bile: there had been no symptoms indicative of their existence, and the patients had died at different periods of the year, in spring, summer, and autumn.

I have also, in subjects cut off by various chronic affections, and more especially in those affected with disease of the liver (perhaps chronic hepatitis), met with biliary calculi, and thickening and ulceration of the walls of the gall-bladder. These morbid states were even of somewhat more frequent occurrence in this category of cases than in those of phthisis. Ulcerations did not always coexist with biliary calculi; but I have never observed the former, unless where a greater or less number of the latter were contained in the gall-bladder. Some of these formations, also, presented themselves in the majority of cases of simple thickening of the mucous tunic.

CHAPTER VI.

SPLEEN.

If it be admitted that the existing state of ignorance, respecting the functions performed by the spleen, renders the study of its anatomical changes less interesting than of those of other organs, their number and frequent occurrence are, at least, well calculated to excite the zeal of observers; and for this reason I have thought I should not be justified in omitting the enumeration of such as I have myself met with in that organ. These anatomical changes consisted of alterations of consistence and of volume, and of adventitious products.

These adventitious products were two in number. One of them, tubercle, existed in the fourteenth part of the cases, or in seven of ninety individuals in whom the spleen was carefully examined. (Cases vi, vii, ix.) The tubercles were, in one of these cases, exceedingly numerous, and of a size varying between that of a hemp-seed and of a filbert. In all the cases except one, they were of more or less perfectly globular form, yellowish colour, opaque, dull-looking, and in all respects similar to tubercles developed in the lungs: they were not encysted, and the surrounding splenic tissue was healthy. The two individuals, in whom they existed in greatest abundance, presented also a considerable number in other parts of the body, the mesentery, the neck, the axillæ, and even the brain. (Case ix.) I did not detect gray, semi-transparent matter beside the tubercles in any case. In one instance the tuberculous matter had not assumed the rounded form, and displayed characters somewhat different from those it possessed in the others. The subject of this case was a man aged thirty-seven, in whom the disease lasted five months; his spleen was somewhat larger than natural, adhered to the diaphragm, and was invested completely by a cartilaginous pseudo-membrane, about half a line [1 millimeter] thick. Under this membrane, on the external or left surface

of the organ, appeared a mass of yellowish tissue, of dull aspect, deficient in determinate structure, very firm, very difficult to tear, not unlike chamois-leather in look, of the form of a segment of a sphere, about five inches and a half [14 centimeters] in diameter, thin in the circumference, and somewhat less than an inch and two lines [3 centimeters] thick at the centre. The other species of adventitious product I met with but in one case: it consisted of rounded, yellowish, shining, elastic, moist-feeling granulations, very different from tuberculous matter, and scattered irregularly through the spleen, which was itself softened and enlarged.

The *dimensions* of the viscus varied extremely: they were much less than natural in fifteen subjects; much greater, double, treble, quadruple, and even more so, in sixteen others. I found that there appeared to be no connexion between this enlargement of the spleen and the continued or intermittent fevers, under which the patients had laboured at a more or less distant period from the fatal event. The spleen was very small in the majority of subjects, who had had paroxysmal, or continued fever of severe kinds; twice only did I find it large under the former circumstances, and once under the latter.

The *consistence* of the spleen was subject to no less variety than its size. It was much greater than natural in ten subjects; and in all the cases, except one, the organ was equally dense in every part of its substance. With this increase of consistence coexisted, in the greater number of individuals, enlargement of the organ, and occasionally also a remarkable degree of friability. Softening, as marked as in typhoid fever, or even more so, was observed in eight of the ninety subjects.

In order to ascertain if any influence in the production of the various states of the spleen just indicated could be fairly ascribed to the existing phthisical disease, I have compared them with those found in the bodies of subjects cut off by all kinds of acute or chronic maladies, indiscriminately. In this class of individuals enlargement of the spleen existed with the same degree of frequency as in the tuberculous; and diminution of bulk was both carried to greater lengths and of more frequent occurrence. Of one hundred and sixty subjects (excluding all those destroyed by typhoid fever,) fifty had spleens of small dimensions. In

twenty of them the diminution of bulk was remarkable; they had died of pneumonia, or some cardiac disease, which shows that the size of the spleen is rather independent, than otherwise, of obstruction of the circulation. The proportion of cases of softening was greater in the victims of acute than of chronic disease, and, on the whole, about the same as in phthisical subjects.—In none of the cases now under consideration were there any tubercles in the spleen.

Of sixty-four phthisical subjects observed at the Hospital of La Charité, from 1825 to 1827, there were six who had tubercles in the spleen; and all these, except one, had them in the liver also. Besides, in one of these persons, there were gray semi-transparent granulations between the yellow tuberculous granulations; an additional fact, showing, with a multitude of others, that an organ having the vesicular structure of the lung is not necessary for the generation of gray semi-transparent granulations.

CHAPTER VII.

URINARY ORGANS.

These organs were rarely the seat of any remarkable alteration.

I have frequently examined the *supra-renal capsules* with care, and the only morbid state I discovered in them was—and this in one instance only—a small quantity of unsoftened tuberculous matter. I never found such matter in these organs in subjects who had died of any other chronic affection but phthisis.

The *kidneys* were perfectly healthy, in respect of consistence, colour, and size, in three fourths of the cases. In sixteen only of ninety individuals were they somewhat redder than natural; in them their consistence was considerably above the natural standard. In four subjects they contained small serous cysts. (Case xix.) A small quantity of tuberculous matter was dis-

covered in four cases; and in one of these the morbid matter extended into the corresponding ureter. The rarity of such an appearance as the latter induces me to relate the case in which I observed it.

Case V. A periwig-maker, aged 24, of delicate scrofulous constitution, but born of healthy parents, sprained his right foot at the age of twelve. For two years he suffered from rather severe pain in the seat of the injury, which ceased then and subsequently recurred only at distant intervals. There were some fistulæ round the ankle-joint, which had discharged a certain quantity of pus, almost uninterruptedly, for the last four years. The patient had nevertheless continued his usual work, and often walked considerable distances without inconvenience. When admitted to the Hospital of La Charité on the 16th of February, 1822, he had suffered from cough, with expectoration, for nineteen months. When the cough first set in, excessively sharp pains in the right side of the chest led to the application of a great number of leeches to the painful place. There had been no hemoptysis, and except within the last six months dyspnœa had scarcely been felt. The appetite had been poor for upwards of a year, and during the last four months was completely gone, while great thirst and frequent diarrhœa had supervened. The patient did not remember to have had perspirations; but there had been rigors the last fifteen days.

February 17th. *Present state.* Last stage of marasmus; loss of strength very considerable; no headach or pains in the limbs or loins; intellectual faculties well developed; speech short; voice clear; respiration rapid; cough moderately frequent, sometimes paroxysmal; sputa few in number, greenish and opaque; percussion-sound clear over the entire chest; pectoriloquous resonance between the shoulders and in the right axilla; skin dry; great heat of surface in the evening; neither perspiration nor rigors the preceding night; pulse moderately rapid; tongue clean and natural at the edges; great thirst; almost complete anorexia; epigastrium free from pain; nausea after coughing from time to time; four watery stools; flatus and colic-pains.

The following days the diarrhœa became rather more severe; but the other symptoms underwent no obvious alteration.

There was slight deafness from the 12th to the 15th of May, on which day the patient expired after delirium of twenty-four hours' continuance.

Sectio Cadaveris; *thirty-six hours after death.*

External appearances. Nothing remarkable. (The brain was removed for anatomical purposes.)

Chest. Adhesion of both lungs superiorly and posteriorly. A small tuberculous cavity at the apex of the left lung; through the remainder of its substance, semi-transparent gray granulations in abundance; around these the pulmonary tissue is perfectly healthy. The organ having been incised from the apex to the base, a multitude of round openings are brought into view: these are the orifices of bronchi more or less thickened and uniformly dilated, to the very surface of the lung. The same appearances existed on the right side; but on this side the cavity in the apex was of small size, the granulations still more numerous, and the bronchi more dilated than on the left.—The heart was of medium size.

Abdomen. The mucous membrane of the stomach red round the cardia; the small intestine presented a few ulcerations, and there were very large ones in the cæcum. The colon and other abdominal viscera, with the exception of the right kidney, were in the natural state. The position and size of this kidney were natural; its upper third was of yellowish colour and tuberous, the lower part of the organ in nowise remarkable. The ureter on the same side was hard, about four lines [8 millimeters] in diameter, becoming less broad and dense as it approached the bladder. The upper third of the proper tissue of the kidney was destroyed, and its place filled by a yellowish, opaque matter, obviously tuberculous; this matter lay upon a pseudo-membrane of the same nature. This membrane extended downwards along the pelvis and ureter, to the walls of which it adhered firmly. Firm on the adherent, it became soft and friable towards the free surface, was from half a line to a line [1 to 2 millimeters] thick, and of greater consistence in the ureter than elsewhere.

I omitted to examine the bladder, contrary to my usual habit, so that I am not aware whether the tuberculous pseudo-membrane extended into its interior. Although it does not appear to me probable that it did so extend, inasmuch as the thickness and hardness of the ureter diminished the nearer the

bladder it was examined, I shall abstain from any kind of conjecture on the matter.

Of the two other subjects, one was a young man, aged eighteen, of tolerably good constitution, generally enjoying good health, not subject to cough, and cut off by phthisis after seven months of illness. Among other morbid appearances discovered on the examination of his body, were a great number of ulcerations in one and the other intestine, tuberculous granulations, and a tænia solium in the part of the jejunum next the ileum, an abundant crop of tubercles in the mesentery, unnatural redness of both kidneys, and at the upper part of that of the right side, a non-encysted tubercle of somewhat oval shape, measuring an inch and two lines [3 centimeters] in its longest diameter, of lemon-yellow colour, and good consistence.

The third subject, too, was a young man. He was of weakly constitution and died five months after the outset of the pulmonary disease. In him, the mucous membrane of the intestinal canal was perfectly healthy in respect of firmness, colour, and thickness; there were no tubercles in the mesentery, but great numbers along the spine in the lumbar regions, around the inlet of the pelvis and along the neck. One of the tubular cones, at the upper part of the right kidney, was completely converted into tuberculous matter, somewhat softened in the centre. Another cone, near the preceding, also contained a small quantity of the same matter, infiltrated here and there through its substance. The intervening tissue was sound.

In these two last cases I found the mucous membrane of the bladder and ureters perfectly healthy, having noted the fact with care at the time. The development of the tuberculous matter in the kidneys, therefore, could not be ascribed to inflammation of that membrane: and how is it possible to regard the pseudo-membrane, investing the pelvis and ureters in the former case, as the product of inflammation of the lymphatic vessels, —an inflammation which several observers regard as the source of tuberculous development?

I found the mucous membrane of the *bladder* very slightly injected in some cases, without being softened in an obvious manner; and in no case, among the one hundred and twenty

analysed in this work, did the submucous or muscular tissue of the bladder exhibit appreciable organic changes. The same is true of sixty other cases observed, subsequently, at the Hospital of La Charité; but two hundred subjects opened since that period, and whose vesical mucous membrane was carefully described on the spot, furnished two examples of tuberculous ulceration of the organ. One of these occurred in the case of a man, aged thirty-five, who died at the Hospital of La Pitié, a few days after admission, and without my having been able to ascertain the duration of his illness. The bladder was of the size of the clenched fist, contained turbid reddish urine, and exhibited, internally, an uneven surface, of yellowish white colour, and without a trace of mucous membrane; the form was that of a curvilinear triangle, the base of which, turned backwards, measured from about two to two and a third inches [50 to 60 millimeters], while the height was less by half. The matter forming the fundus of the ulceration had all the characters of tuberculous matter, and measured about one line [2 millimeters] in thickness. Underneath were found tuberculous granulations, of a diameter of nearly a line [2 millimeters] and the intervening cellular tissue was perfectly healthy.

The cases I collected at the Hospital of La Charité, subsequently to the appearance of my former edition, corroborate the statement just made of the rarity of tubercles of the kidney. In two instances only, in truth, out of fifty cases examined, did I find tubercles in these viscera, or in the supra-renal capsules. These tubercles were crude, spherical, and few in number; and at the upper part of the left kidney I found, in one case, a gray semi-transparent matter, continuous with a yellow blackish substance, of the size of a walnut, softened, areolar, and containing a yellowish clear-coloured fluid in its centre. Again, of thirty bodies, most of them of males, carefully examined at the Hospital of La Pitié, not one presented either tubercles or gray semi-transparent granulations in the kidneys.

This result harmonizes with the statements of M. Rayer, in his great work on 'Diseases of the Kidneys:' while he there affirms that renal tubercles are less rare than is generally believed, he observes that they are far from being of frequent occurrence.

Another anatomical change, much rarer even than renal tubercles, in phthisis, is *fatty transformation* of the kidneys. In two hundred and fourteen cases observed by myself, I ascertained the existence of this transformation once,—in a male, aged sixty, who died at the Hospital of La Pitié, after five months' illness. There had been no symptoms, apparently at least, furnished by the urinary organs; but, on examination after death, I found the left kidney closely adherent to the psoas parvus and the spleen, and transformed into a fatty mass, larger by a third than the right kidney. The transformation affected the entire organ, except a portion, two lines [4 millimeters] thick, and from two inches and four lines to two inches and nine lines [6 to 7 centimeters] in superficial extent, where the natural characters of the renal tissue were retained. The calices existed still, and were easily to be recognized; whereas the pelvis had disappeared, having been transformed, with the entire of the ureter, into a solid cord. The fatty tissue in several places retained the form of the tubular cones; and at their circumference, at a certain distance from their apex, appeared laminæ, having the aspect of cellular tissue, and rendered distinct by their shining blueish colour. Each of the cones of fatty substance was pretty easily broken down with the finger, in about the same manner as a softened kidney.

Although this is the only instance of the kind which has presented itself to my observation, it deserves attentive consideration, inasmuch as it supplies a new proof of the tendency of the viscera to undergo fatty transformation in phthisis.

I have carefully examined the kidneys of nearly five hundred subjects cut off by all varieties of disease, without discovering the smallest particle of tuberculous or fatty matter. However, an able observer, M. Rayer, states in the work already referred to, that although rarely, still he has met with tubercles in the kidneys, when none existed in the lungs. I have in vain searched for an instance of the fact in M. Rayer's work. There is, no doubt, a case of renal tubercles, in which the individual presenting them had only two gray semi-transparent granulations in the lungs: but this case does not constitute an exception; and it is a question whether the few instances to which M. Rayer refers have escaped me. Besides, in these cases the other morbid appearances

were the same as in phthisis.[1] I have also, except in four instances, invariably found the mucous membrane of the bladder perfectly healthy in non-tuberculous subjects,—setting aside those afflicted with cancer of the uterus, in a certain number of whom I found at the fundus of the bladder regular membranous productions, which I have described in the 'Répertoire,' edited by M. Breschet.

CHAPTER VIII.

GENITAL ORGANS.

SECTION I.—MALE GENITAL ORGANS.

In the small number of cases in which I examined the penis of phthisical subjects, I discovered nothing remarkable in that organ. But out of forty patients in whom the prostate, vesiculæ seminales, and vasa deferentia were closely examined, three presented a variable quantity of tuberculous matter in the prostate, and in one of them (the subject of the next case), this substance existed at once in the prostate, the vesiculæ seminales, and vasa deferentia.

Case VI. A German tailor, aged 24, not of strong constitution, but yet rarely actually ill, with fair skin and hair, well shaped and rather thin, was admitted into the Hospital of La Charité, October 27th, 1824. He had been ill for fifteen days, had been seized at the outset, in the midst of perfect health and without apparent cause, with rather copious hemoptysis, which had continued since, in spite of two bleedings, rest, and abstinence. Cough set in at the same time; heat of skin and copious night-perspirations supervened; the appetite failed, and he suffered from urgent thirst. Neither heat nor pain in the chest had been felt.

[1] Traité des Maladies des Reins et des altérations de la Sécrétion urinaire. Paris, 1840.

October 28th. *Present state.* Pallor of the entire surface, lips, and tongue; prostration of strength; rather frequent cough; the spitting-vessel partly filled with blood of more or less spumous appearance, fluid, and blackish; percussion of the chest produces a clear sound; respiration distinct, somewhat less strong immediately under the clavicle than elsewhere; pulse 90, small; heat of skin natural; thirst rather urgent; appetite very slight; abdomen free from pain and tenderness; bowels confined.

V.S. to nearly eight ounces [240 *grammes*]; *light emulsion; mustard foot-bath.*

The hemoptysis ceased completely on the 30th, and did not return.

During the three following months, or up to the 5th of February, the day of the patient's death, the cough was generally very troublesome in the night, the sputa abundant, composed of a clear fluid, with, towards the end of November and during the following month, a few others somewhat opaque and occasionally nummulated. They were slightly grayish, semi-vitreous, and small in quantity, almost all the month of January.

December 2d. Respiration harsh, without rhonchus, under the clavicles.—January 9th. This condition still more marked; on the left side the respiratory murmur mingled with rather fine crepitation in the lower half of the side anteriorly and over the whole surface posteriorly; the percussion-sound continued clear.—25th. Percussion-sound very dull over a surface of three inches and seven lines [9 centimeters] under the left clavicle; manifest pectoriloquy here.—From the middle of January there was considerable dyspnœa; no pain ever either in the larynx or in the region of the trachea; no affection of the voice occurred till the closing eight days.

The pulse, by no means frequent during the months of November and December, subsequently became so; and from the 15th to the 20th of January beat from 95 to 110 times in a minute. The cutaneous temperature rose with the pulse; there were almost constant night-sweats, nearly always limited to the upper part of the body, and occasionally irregular rigors during the last month.

Shortly after the patient's admission, the appetite improved, and his allowance of food was gradually increased, so that at the

close of November and during the following month he had the quarter or half of house-allowance. The bowels were confined, and linseed enemata required during the first two months to produce any action from them; subsequently the motions became frequent and liquid. There were neither colic-pains, nausea, nor vomiting; he constantly suffered from thirst.

From the time diarrhœa set in, the patient rapidly lost strength; for the last twenty days he kept his bed altogether. There was some little delirium a few hours before death, which event occurred at four o'clock in the afternoon.

A blister was applied to the left arm in the beginning of December; and from that time to the close, friction in the axillæ with hydriodate of potass ointment daily employed.

Sectio Cadaveris; *forty hours after death.*

External appearances. Commencement of the last stage of marasmus; no œdema.

Head. Subarachnoid tissue very slightly infiltrated with serosity; a few white opaque miliary granulations, springing from the arachnoid membrane in the central fissures; a tablespoonful of transparent serosity in the left lateral ventricle, somewhat less in the right; two more tablespoonfuls in the inferior occipital fossa.—Immediately below the pons Varolii, in the substance of the medulla oblongata, appeared a tubercle as large as a medium-sized pea, neither encysted nor softened;—the medullary substance around being natural. The rest of the encephalon perfectly healthy.

Neck. Nothing remarkable in the epiglottis. A deep round ulceration, measuring one line and a half [3 millimeters] in diameter, seated at the point of union of the chordæ vocales. Mucous membrane of the trachea slightly red inferiorly, of proper consistence and thickness.

Chest. From about four to five ounces [120 to 150 grammes] of transparent serosity in each pleural cavity. A white narrow band passed from the costal pleura to the apex of the left lung, where it was attached opposite one of the tuberculous cavities present. The upper lobe of this lung was hard throughout, presented numerous yellow spots on the surface, two small cavities at its upper part, and in the rest of its substance an innumerable quantity of tubercles, of irregular form, of the size of a pea or a hazel-nut; many of them confluent, and some

softened or even partly evacuated. These were much fewer in the lower lobe, and none of them softened; here almost all of them were surrounded with hepatized tissue.—On the *right* side the lower lobe was somewhat engorged, and contained no tubercles; the upper contained fewer (all of them in the crude state) than the same part of the left lung. There was no trace of gray semi-transparent matter in either lung.—Bronchi of a uniform pale pink colour.—Heart small and healthy; aorta natural.

Abdomen. The stomach contained a great deal of green bile and a little thick tenacious mucus; mucous membrane yellow and very soft in a small portion of the fundus; along the great curvature, over an elongated surface, measuring from eighteen to twenty inches [45 to 50 centimeters] it was mammillated, reddish, and grayish, more than half a line [1 millimeter] thick, and appeared evidently more prominent than the surrounding parts; elsewhere it was perfectly healthy.—Mucous membrane of the small intestine in good condition in its upper third; presents transverse ulcerations in the middle third; and longitudinal and elliptical ones (like the patches of Peyer, of which they occupied the seat) in the lower. The transverse ulcerations did not circumscribe the intestine completely; measured one inch and two lines or one inch and six lines [3 or 4 centimeters] in width at their central part, and were more or less contracted at their extremities; here the mucous membrane was completely destroyed, and the surface of the ulcerations very uneven, in consequence of partial thickening and destruction of the corresponding submucous tissue. Their circumference was prominent, of reddish and yellowish colour, from the presence of a rather considerable number of softened tubercles in the substance of the submucous tissue. Externally, the part of the intestine corresponding to these ulcerations, of more or less grayish and violet colour, exhibited inequalities of surface arising from tuberculous granulations placed between the peritoneal and muscular coats. The mucous membrane had not disappeared from the entire surface of the longitudinal ulcerations. The surface of these was uneven in the same manner as of the preceding sort, and for the same reason; and also in consequence of the presence of bands crossing them, formed of undestroyed mucous membrane. Between the ulcerations this

membrane appeared healthy.—Throughout the large intestine the mucous tunic was pale, thickened, and as soft as mucus. The cæcum and ascending colon presented five tuberculous ulcerations, of irregular form and inconsiderable size: the muscular tunic was not exposed at their fundus.—All the mesenteric glands were of large size and almost completely tuberculous; several of those of the meso-cæcum and ascending meso-colon had undergone the same transformation.—Liver pale and somewhat fatty; bile contained in the gall-bladder extremely thick and of very deep colour.—The spleen contained from six to twelve tuberculous granulations of the size of a small pea, and its tissue was redder than natural.—Kidneys and bladder perfectly healthy.—Prostate of the usual size, and almost completely converted into unsoftened tuberculous matter.—Vesiculæ seminales indurated, somewhat larger than natural, and filled with very firm tuberculous matter, separated from space to space by septa corresponding to those existing in the natural state. These septa were hard, grayish, more than half a line [1 millimeter] thick, and resembling the parietes of the vesiculæ themselves. From the neck of the latter to about three inches and seven lines [9 centimeters] further on, the vasa deferentia measured about three lines [6 millimeters] in diameter, and had all the firm resistance of a tense cord. Their breadth decreased a little towards the spot mentioned; their parietes were of double the natural thickness, of a gray colour, almost completely opaque, like those of the vesiculæ, and their interior filled, within the limits stated, with firm unsoftened tuberculous matter. Further on, all was in the natural state.

Without, for the present, dwelling upon all the circumstances of this case worthy of attention, I may remark that the original form, and anatomical arrangement of the vesiculæ seminales still subsisted;—that there was not transformation of tissue, but development of tuberculous matter; that this development was the result of a morbid secretion into the vesiculæ and the vasa deferentia, as into the ureter of the subject whose history I narrated in the last chapter;—that these facts are closely analogous to the phenomena of certain cases of tuberculous peritonitis, to which I shall, by and by, direct the reader's attention, and that they are strongly opposed, as I have

already said, to the opinion of those who regard tubercles as the product of inflammation of the lymphatic vessels.

Another circumstance deserves to be particularly noticed,—I mean the fact that the tuberculous matter existing in various places, other than the lungs, as the medulla oblongata, the folds of the mesentery, the spleen, the prostate, &c., was in all of them, in the same stage of development, unsoftened: this would apparently denote the action of a single cause acting at once upon all these points.

Since the publication of my former edition, I have but rarely opened the urethra of tuberculous subjects, and I have never yet observed tubercles in that canal. M. Rayer, however, quotes two examples of the kind;—one of them observed in his own wards, the other communicated to him by M. Vernois. The former occurred in the case of a man, aged thirty-six, who had also tubercles in the kidneys, the testicles, the prostate, &c.; the latter, of a boy, aged twelve, with tubercles besides in the kidneys, on the surface of the peritoneum, &c.: in this case the disease, to all appearance, implicated the entire length of the urethra; in the other it affected an extent of two inches and four lines [6 centimeters] in the neighbourhood of the bladder.

I have not in a single instance observed tubercles in the prostate, vesiculæ seminales, or vasa deferentia of the victims of any other acute or chronic disease, except phthisis.

SECTION II.—FEMALE GENITAL ORGANS.

Except in respect of dimensions, the condition of these organs was almost always natural.

The colour of the *vagina* was white, pink, or violet-red in about the same proportion of cases as in subjects cut off by all varieties of disease; obstruction of the circulation, slight or marked, did not appear to me to exercise a very notable influence on this state. In no case did the walls of the vagina exhibit organic alteration.

The *uterus* was generally smaller than natural: as in subjects dying of affections unconnected with phthisis, I have several

times discovered, in the interior of its body or neck, soft polypi, of small size and pale colour;—sometimes also fibrous tumours of inconsiderable dimensions (those of a hazel-nut, or less,) developed in the substance of its walls, at a variable distance from the peritoneum. In one case I found the most superficial layer of the internal surface of the body and neck of the uterus transformed, to the depth of a line [2 millimeters], into tuberculous matter, (Case xxxii;) and in the midst of healthy tissue immediately underneath miliary yellowish granulations of the same nature. In this case menstruation had continued regular, until three months before the patient's death; and it may be presumed that the development of the tuberculous matter did not occur till within that period.

I have in two instances observed a small quantity of the same matter in the *ovaries;* these organs contained serous cysts, generally of inconsiderable dimensions, in about the same proportion of cases as in other chronic diseases.

Since the publication of the first edition of this work I have not met with tuberculous disease of the uterus more frequently than before; out of two hundred phthisical females and upwards, three only furnished examples of that condition. No doubt, indeed, can be entertained of its rarity; for as has been observed by M. Reynaud, in an excellent essay on tubercles of the uterus,[1] Bayle makes no mention in his 'Researches on Pulmonary Phthisis' of an anatomical alteration of the uterus, referrible to tuberculous degeneration of the organ; no example of the kind is to be found in the 'Clinque' of M. Andral;—Laennec is silent on the point;—and M. Reynaud himself, during a sojourn of six years in the Paris Hospitals, (five of these in La Charité,) employed as he was in opening a great number of bodies, met but once with the condition in question. In the year 1830, while engaged in clinical observations at the Hospital of La Pitié, the same inquirer met with two additional cases of tuberculous affection of the uterus. The subject of one of these cases, aged thirty-nine, menstruated first at the age of twelve, and continued to do so in a regular manner until 1829; she had had some children, and her confinements had

[1] Archives gén. de Méd. t. xxxi, p. 486.

been natural. She died after nine months' illness: on examination after death softened tuberculous matter, mixed with mucus, which flowed forth upon slight pressure of the neck of the uterus, was found in the interior of the vagina, together with a multitude of ulcerations, varying in size from that of a lentil to that of a "centime," of more or less irregular shape, with a red fundus, and much more numerous at the posterior than lateral aspects of the passage: there were none of them anteriorly. The uterus was a little more than three inches and seven lines [9 centimeters] long, and the anterior lip of the neck somewhat swollen; the interior of this part exhibited a yellowish colour, and contained a stratum of tuberculous matter, the most superficial part of which could be easily rubbed away, while the most deeply-seated, one line [2 millimeters] thick, was combined with the substance of the uterus, irregular in outline, and divided by a number of broken furrows, which gave it something of a mammillated aspect: besides this, the tissue of the uterus sent off into the substance of this tuberculous stratum, certain processes from which sprang a multitude of delicate vegetations, capped, as it were, with tuberculous matter. A tubercle of the size of an ordinary pea was found in the substance of the body of the uterus, and underneath the tuberculous stratum; its tissue was somewhat grayish and slightly transparent, so that it might be made a question whether this state had not, as in the lung, preceded the yellow and opaque. The fallopian tubes, too, were filled with tuberculous matter, and their caliber increased to more than five times the natural amount; their internal surface even exhibited tuberculous matter.

M. Reynaud observes, correctly, as it appears to me, that the fact of ulcerations existing in the most dependent part of the vagina, in that part which was incessantly bathed with tuberculous matter, escaping from the uterus, is in all respects similar to that noticed in respect of ulcerations of the air-passages, and their relation to the discharge from cavities;—and that, further, it goes to support what I have said upon the mechanism or cause of ulcerations of the trachea and of parts placed lower down.

The other case observed by M. Reynaud was that of a woman, aged forty-five, mother of seven children, having menstruated first at the age of fourteen and continued perfectly

regular until her thirty-eighth year, when she became irregular, and continued so until the eighth month before her decease; during the eight months preceding that event there was complete amenorrhœa. It was accurately ascertained during life that she had had no vaginal discharge; on examination after death, the uterus was found larger than natural, the neck seven and a half or eight lines [15 or 16 millimeters] thick, almost as hard as cartilage, creaking when divided with a cutting instrument, of close fibrous structure, and dull white colour. The part next the neck of the uterus had the same structure within a breadth of from four to five lines [8 to 10 millimeters]. The cavity of the body presented from within outwards: 1, an uneven tuberculous stratum, easily removed by scraping; 2, an uneven papillary-like surface, of the thickness of a sheet of paper, having the yellow colour of tubercle; 3, underneath the tissue of the uterus, of grayish colour, slightly transparent,—more deeply of a dull white and fibrous aspect,—and, deeper still, perfectly natural. The fallopian tubes were much enlarged, measuring about an inch and a half or two inches [4 or 5 centimeters] in circumference where largest. One of them presented in that portion of its course comprised within the substance of the uterus, two tuberculous spots, forming prominences on its internal surface. Further on, the tube was filled with tuberculous matter, of yellowish white colour, scarcely moist, and somewhat elastic; underneath, a layer of tuberculous matter was found, in combination, as it were, with the parietes of the tube, which were themselves rugose. The same appearances existed in the other tube.

M. Reynaud justly dwells upon the analogy of these two cases, and upon the absence of vaginal ulceration in the second, where there had been no discharge of tuberculous matter.

I have not found tuberculous matter in the substance of the walls of the uterus, except in phthisical subjects. Morbid appearances of other kinds existed in about the same proportions in them and in the victims of various other affections.

CHAPTER IX.

PERITONEUM.

Effusion of serosity into the peritoneum was very frequently observed. I met with it twenty-two times, or in one fifth of the cases, to an amount varying from about one pint and three quarters to fourteen pints [1 to 8 litres]. The two sexes exhibited this condition with equal frequency, and it was not more common in subjects with fatty livers and tuberculous mesentery than in persons free from those forms of disease.

Occasionally some *yellowish soft* pseudo-membrane or a certain quantity of thick pus, without smell, and resembling that of an acute abscess, coexisted with the serous effuson. (Cases iv, xxiv, liv.) These appearances, which were noticed in four subjects, could not be otherwise than the result of acute peritonitis; and the symptoms observed during life showed that the inflammation had only set in a few days, commonly only one day even, before death. The fourth and twenty-fourth cases support this assertion. In another case also (Case liv) the peritonitis appears to have come on within the last twenty-four hours: I did not notice the ordinary symptoms of the affection, but I think I am justified in attributing to it the extreme state of agitation, testified to by the nurses and attendants, suffered by the patient on the eve of her death.

These few facts show that the peritoneum, like the other organs, is susceptible of acute inflammation at the close of phthisis; and that, even under these circumstances, the inflammation is pretty frequently accompanied by the symptoms it determines under others.

I found *partial cellular adhesions of old standing* in three cases; in a fourth there were *general* adhesions of the same kind, (Case xxii,)—the result of chronic peritonitis with which the patient had been attacked two years and a half before death.

In another case (Case XLVII) I observed a great number of semi-transparent *miliary granulations* on the free surface of the peritoneum, and on the great omentum, as it were deposited in the substance of an imperfectly opaque pseudo-membrane; they came away with it when it was removed. I also found, between the contiguous parts of a pseudo-membrane, investing the intestines, and the anterior wall of the abdomen, certain patches of tuberculous matter, of more or less considerable dimensions. (Case LV.) And I shall here relate the particulars of a case rendered very remarkable by the development of the same matter in the great omentum and meso-colon.

CASE VII. A man in a hosier's shop, aged 27, not of strong constitution, inhabiting Paris for the last month, was admitted into the Hospital of La Charité on April the 7th, 1824, stating that he had been four weeks ill. At the outset, some time after having been wet on a journey, cough and expectoration, rigors, and some failure of appetite came on. These symptoms continued; considerable thirst set in, the appetite failed completely; rigors occurred from the slightest cause; the cough had greatly increased in violence within the last eight days, and within that time the patient had suffered from dyspnœa. From the first there had been marked loss of strength, soon followed by œdematous swelling of the legs. The patient had not, however, confined himself to bed; he took a little exercise daily, and had not suffered from abdominal pain.

April 8th. *Present state.* Face slightly coloured; trifling infiltration of the lower part of the legs; considerable diminution of strength; sputa greenish and yellowish, imperfectly opaque, some of them grayish, semi-transparent, and, as it were, vitreous; cough frequent; oppression of breathing marked; speech short; mucous rhonchus posteriorly, principally on the left side, from the apex to the base of the chest; percussion sonorous; pulse somewhat frequent; heat of skin inconsiderable; tongue dry, somewhat red; mouth clammy; thirst urgent; anorexia; abdomen tense, arched, slightly sonorous in every part, free from pain; from time to time, however, the patient felt slight uneasiness there; stools rare.

Solution of triticum repens in ptisan, with oxymel and nitre; two enemas of pellitory; gum potion; two rice-creams; three broths.

The same symptoms continued, with more or less severity, until the 29th of August, the day of the patient's death: their increase was so gradual as to be almost insensible: the cough was generally very slight; the sputa, such as those already described, small in quantity; occasionally an entire day passed without the occurrence either of cough or expectoration. During the closing three months of life the lower two thirds of the right side of the chest emitted no sound under percussion; the respiration was extremely obscure and distant there; there were, occasionally, bubbles of crackling rhonchus under the clavicle of the same side: on the left side, the respiration was somewhat more feeble, in the same situation, than at the lower part of the chest, and the respiratory murmur sometimes mixed with mucous rhonchus, or more rarely with feeble and imperfect crepitation.

The pulse was somewhat frequent for the first fifteen days, after which it became calm, and did not again become frequent until towards the close; it was always weak and regular. The state of the skin varied with the pulse, when this lost its frequency, there was no heat of surface; there was rarely anything of the kind by night, and still more rarely perspiration.

The tongue was almost constantly red and dry during the four months in question; and towards the closing days a small ulceration made its appearance on the right side of the organ. The patient's thirst diminished with the decrease of fever, and increased, though to a small amount, with its increase. After a few days' abstinence the appetite reappeared, and subsequently the patient constantly asked for food; but he was only allowed a few rice-creams, and a little milk. Nausea was of rare occurrence, and there was never any vomiting.—The abdomen was more or less full, and occasionally the seat of uneasiness; at no period were there any colic-pains. Towards the close of May, diarrhœa appeared, continued during the early part of June, then ceased, subsequently reappeared on different occasions, and was very copious during the last days of life.

The face soon lost the slight colour at first observed, and became pale, and somewhat yellowish; the patient grew weary, from the length of his illness, without exhibiting any great uneasiness about it; he spoke only of the size of his abdomen, and of the flatus, to which he ascribed the enlargement. The

loss of flesh was rapid, that of strength slow; to the last day he walked about the wards. With the increase of weakness increasing tendency to sleep was observed. The 29th of August, at nine o'clock in the evening, he got up to have a motion, and had scarcely been placed upon the night-chair when he fell against the wall: he was put back to bed. A quarter of an hour afterwards he rose again, got back to bed, supported by a male attendant, and expired at half-past nine o'clock, without a struggle (sans agonie.)

The treatment consisted of the exhibition of diluents, gentle diuretics, and weak astringents.

Sectio Cadaveris; *thirty-four hours after death.*

External appearances. General subcutaneous emphysema, more highly developed in the neck and lateral parts of the trunk than elsewhere,—accompanied with phlyctenæ, filled with a violet-coloured liquid. The arms crepitated, and were nevertheless very small,—a proof of the extreme emaciation of the subject.

Head. Two small tablespoonfuls of serosity in the upper part of the arachnoid: a little more in the inferior occipital fossæ; very slight sub-arachnoid infiltration: brain somewhat soft; softening of almost pulpy character of the septum lucidum and lower part of the fornix; about a tablespoonful of serosity in each lateral ventricle.

Neck. Epiglottis and larynx natural. Mucous membrane of trachea of a livid pink colour, without change of consistence or thickness.

Chest. *Left* lung, free from adhesion, of ash colour, interspersed with whitish spots, corresponding to masses, of variable size, of gray and tuberculous matter, larger and more numerous in the upper than the lower lobe. There was no cavity, and the pulmonary tissue round the tubercles appeared healthy. The *right* lung exhibited the same alteration of texture and its lower two thirds were covered with pseudo-membrane adhering to similar structure on the corresponding costal surface, by means of filaments, containing among them nearly ten ounces [300 grammes] of transparent serosity. The bronchi were thin, and of the peculiar pinkish tint observed in the skin of an onion. —The heart was of natural size, and contained a small quantity of pale and spumous blood; its substance was extremely

flaccid, and the walls of both ventricles thin, those of the left measured only three lines [6 millimeters] in thickness. They were so yielding, that on first sight the fleshy fibres appeared to be separated from each other by a certain quantity of gas; but this was not the case.

Abdomen. Cellular filamentous adhesions of variable length between the anterior parietes and the subjacent parts. The great omentum overlaps the greater part of the small intestine, and forms a sort of flattened cake, from an inch to an inch and three lines [24 to 30 millimeters] thick, more or less uneven, yellow and blueish in alternate places, and composed of tuberculous and of semi-transparent, gray, violet-coloured substance. The former constituted four fifths of the mass, and was not softened anywhere. The meso-colon and meso-rectum had undergone the same change; but their thickness was one half less than that of the omentum.—The greater number of the mesenteric glands were tuberculous.—Pseudo-membranous adhesions, rarely separable, existed both on the liver and diaphragm; the liver was of dark bistre colour, very moderate size, very soft, and of such low specific gravity that it floated on the top of water like a healthy lung: internally, it exhibited an infinite number of empty spaces, varying in size from that of a millet-seed to that of a pea, and, taken together, forming a larger space than that occupied by solid tissue. The bile in the gall-bladder was light-coloured and small in quantity.—The spleen was somewhat larger than usual; the peritoneal investment separated from the lower half of its surface; where that membrane formed a sort of sac, containing at least two ounces [60 grammes] of blackish fluid. The substance of the organ was entirely softened, and its colour blackish.—Kidneys natural.—Stomach covered in part with pseudo-membrane: although it had been separated with the very greatest care from the surrounding parts, it exhibited a rounded opening to the left of the cardia, with pale and thin edges; but as no effusion existed, the perforation must be regarded as the effect of some slight traction during the examination, and not as an appearance produced before death. Internally, the aspect of the stomach differed exceedingly in two places of considerable superficies. Near the pylorus it was of grayish colour, its mucous membrane mammillated, of good consistence, imperfectly destroyed in twenty

places, seated more or less closely to each other, to the width of two lines [4 millimeters] ; elsewhere it was of blueish white, or light bistre colour, extremely soft and thin, and the subjacent tissues easily torn. Mucous membrane of the small intestine pale, and as soft as mucus, throughout its entire extent ; that of the colon somewhat less so. No ulceration in either intestine.

This case appears to me to present more than one point of interest. In respect of the tuberculous matter, it supplies an example (the sole one I have seen) of an equal amount of development of that matter in all the places wherein it had been deposited, the lungs, the mesentery, the omentum, &c. In all my other cases, in truth, tuberculous matter was in a more advanced stage of progress in the lungs than elsewhere. The symptoms, manifested as they were simultaneously in the chest and lungs, were in harmony with the state of the organs.

The coexistence of a certain quantity of blueish gray, semi-transparent substance with the tuberculous matter in the omentum, affords a new proof of the relationship existing between these two kinds of production.

In several cases of prompt death from acute disease, and more especially from eruptive affections, I have seen general emphysema of the subcutaneous cellular membrane, but rarely so highly developed as in the present instance : this is, besides, the only example of the occurrence I have met with after chronic disease ; nor have I ever, except in this case, seen emphysema of the liver. And the emphysema of this organ does not appear to have been the most remarkable phenomenon connected with it ; its size, scarcely equal to that existing in the healthy state, seems to me still more extraordinary. For if we suppose that the emphysema was developed shortly after, or a little before death, we must admit the liver to have previously been most extraordinarily small ; and inasmuch as there has, perhaps, been no example ever met with of so small a liver as we should be constrained to imagine under this hypothesis, we are almost inevitably led to believe that, in the case in question, the emphysema was developed long before death, in a gradual manner, and in consequence of some morbid alteration or other of the parenchyma of the organ.

Again, the flaccidity, the elasticity, and the slight thickness

of the walls of the left ventricle, were a combination of remarkable conditions, assimilating the state of this organ, to a certain degree, to that of the liver. I have not, in any case, observed more complete softening of the tissue of the spleen, and the separation of its peritoneal investment was to me a novel appearance. The anatomical changes in the mucous membrane of the stomach, small intestine, and colon, could scarcely have been carried further; and nevertheless, amid disturbance so general and so advanced, the patient was free from pain, almost so from fever, and death occurred at a time when it was not expected.

In the last two chapters we have seen tuberculous matter deposited on the free surface of mucous membranes, in the ureters, in the vesiculæ seminales, and the vasa deferentia,—that is to say, formed by means of secretion or exhalation. In the present case the same mode of development, no doubt, prevailed, in respect of the great omentum, and the patches of tuberculous matter between the folds of the pseudo-membrane investing the walls of the abdomen. It is even probable that cases of this kind are not unusual, and that exhalation is one of the processes most frequently employed by nature in the production of tuberculous matter. There is the stronger motive for believing in the reality of such mode of origin, in the fact that exhalation is the source of other morbid products, as deleterious in nature,—of cancerous matter, for example, when it is developed on the free surface of the peritoneum.

I have, since the publication of the former edition, met with similar appearances to those just described, I mean traces of peritonitis, more or less general, in subjects carried off by tuberculous disease. In these cases the abdominal viscera were more or less closely agglutinated, by means of pseudo-membrane either organized, or, as was more common, non-organized, and studded with a variable quantity of tubercles. These additional cases (eight in number) added to the former five, will afford us material for a few moments' consideration.

In five of these thirteen cases there were tuberculous pseudo-membranes, accompanied with effusion of serosity to a variable amount, which I did not observe in the others. The effusion was of grecnish colour, puriform in two cases, serous in two others, and in the fifth there were at once effusion of light-

coloured serosity in the flanks, and effusion of pus to the same amount (less than a pint and three-quarters [1 litre]) in the lower pelvis.

In these five cases the tuberculous or pulmonary disease had run a course of not more than from forty-four days to four months; whereas its minimum duration had been five months in the others. Nevertheless, (and this is a fact of which the proof will appear when we are engaged with the subject of the symptoms of peritonitis,) the progress of this affection had been slow in every case; and the only conclusion we are at present justified in drawing from the facts before us is, that the existence of peritoneal pseudo-membranes, developed in the course of chronic peritonitis, does not prevent in some instances the supervention of acute peritonitis, as a complication,—and that further, at a certain period of chronic peritonitis, serous effusion, which subsequently undergoes absorption, (as is so common in simple inflammation of the serous membranes,) possibly exists in the cavity of the peritoneum.

As I have already mentioned, the appearances of the adhesions in the thirteen cases referred to varied materially. Thus, in one instance (Case XXII) they were cellular, and free from tubercle: their characters were the same, too, in another, where the great omentum and meso-colon had undergone tuberculization. (Case VII.) In a third, at the same time that the adhesions were cellular and loose, they were studded with grayish and whitish granulations, not as yet presenting the truly tuberculous aspect: in a fourth, the convolutions of the intestines were bound together by delicate cellular-like pseudo-membranes, containing semi-transparent miliary granulations in numbers. In the remaining nine cases the different abdominal viscera were agglutinated to each other, and to the walls of the abdomen, by pseudo-membranes, generally of grayish colour, varying in thickness, and studded with rounded prominent tubercles, or partially transformed into tuberculous matter. In one case, when the pseudo-membranes themselves contained no tubercles, I found, in certain places *between them*, lamellæ of tuberculous matter; as if the pseudo-membranous structure had acquired, by semi-organization, the faculty of secreting this matter.

In the cases where the pseudo-membranes, without being partially transformed into tubercles, exhibited distinct granulations,

these productions did not all of them stand in the same relationship to the peritoneum. In the greater number of cases the tubercles and pseudo-membrane were removable together; in two instances the former remained adherent to the peritoneum, when the latter was separated from it. In one case the tubercles adhered to the free surface of the peritoneum, without being surrounded, or in any way accompanied with pseudo-membrane; and in three others the morbid products were placed underneath, or on the attached surface of, the peritoneum.

The last-mentioned fact is not without its importance, for it shows that in the greater number of cases, where traces of peritoneal inflammation are found in persons carried off by phthisis, this inflammation is far from being attributable to sub-peritoneal tubercles seated superficially.

Lastly, six of the thirteen individuals, whose cases we are considering, displayed the transformation described in the last case,—that of the great omentum, the meso-colon and other folds of the peritoneum into gray semi-transparent and tuberculous matter.

We have just seen that, in consequence of their rarity, sub-peritoneal tubercles cannot be considered a very obvious cause of chronic inflammation of the peritoneum; but there would seem a motive for believing that the reverse must be the fact in regard to certain other anatomical changes,—for example, ulcerations of the intestines, which are so common, and oftentimes so numerous and deep, in phthisical subjects. However, facts, as is very frequently the case, do not bear out this *à priori* view. In truth, of the thirteen cases we have been considering, three only exhibited ulcerations of any remarkable size and number, (Cases XXII, LIV;) there were no traces of such change in four cases, and the ulcerations were small, and, generally speaking, very far from numerous in the others. Whence the general inference, that if ulcerations of the intestine and sub-peritoneal tubercles are not altogether without influence on the development of chronic peritonitis, this influence is at least inconsiderable in amount, and but seldom exercised.

As we cannot with any degree of certainty ascribe the chronic peritonitis of phthisical subjects to ulcerations of the bowel or sub-peritoneal tubercles, even when actually present, (because both these morbid conditions, are, occasionally, altogether absent,

or exist to so slight an amount, that they cannot be taken into consideration in respect of the point before us,) it follows that we must admit the agency of some special cause in the production of that inflammation; and, doubtless, the intensity and duration of the existing febrile action give additional efficiency to that special cause, in the same manner as in a certain proportion of cases of acute disease.

The agglutination of the convolutions of the intestines with pseudo-membrane must assuredly interfere materially with the performance of their functions; and this interference must be carried to its height, when the disorganization, already described, of the great omentum, transverse meso-colon, and other folds of the peritoneum is likewise present. Under the latter circumstances the abdominal viscera are, as it were, imprisoned and cannot play upon each other; and it is hardly conceivable how such parts of the bowel as require a certain freedom of movement, for the performance of their functions, can continue to discharge these. And yet, serious as all this is, in order fully to comprehend the baneful character of the morbid state under consideration, and form a just estimate of its importance, in respect of prognosis, we must take a rapid survey of the condition of the other organs, besides the peritoneum, in our thirteen cases.

To commence with the lungs,—the anatomical changes in these organs were, generally speaking, less considerable in this class of individuals, than in those who died free from chronic peritonitis. In six only of the thirteen was there any excavation of the lung, and the cavities were very small in three subjects (Case LIV); of medium size, and limited to one of the lungs in a fourth (Case LV); of considerable dimensions in five [two?] only. (Cases XXII, XLVII.) Usually the tubercles themselves were in small quantity; thus, in the three cases of small cavities, a few tubercles or semi-transparent gray granulations only were found between them; and in five subjects (whose lungs were free from excavation) a few tubercles only, of medium size, softened or unsoftened, in one lung,—or about fifty little tubercles, or a less number even, scattered through both organs,—or, as observed in one case, a tuberculous or grayish mass at the apices of both lungs.

The proportion of cases in which the mucous membrane of

the stomach and that of the intestines were softened did not obviously differ from that observed in the category of subjects with healthy peritoneum; but in addition, as we have already seen, the ulcerations of the intestine were rare, and, when they existed, were, generally speaking, few in number, and not deeply excavated. The liver was fatty in two cases only.

Hence, setting aside the morbid changes of the peritoneum, those of the various organs—of the lungs and intestine, in particular—were usually slight in these thirteen patients; so that no doubt can be entertained that the chronic peritonitis played a great part in bringing the phthisical disease to its fatal close. This becomes still more certain when we remember that this disease ran a very rapid course in several of these cases, and in particular in one of them (Case XVIII,) where the affection lasted forty-four days only, and the lung contained only a few tubercles, while the intestines were free from ulcerations.

A circumstance well deserving of note is, that the conditions favorable to the development of chronic tuberculous peritonitis, similarly conduce to the generation of pleurisy of the same kind. This follows from the fact, that in four of the thirteen cases there were tuberculous pseudo-membranes in the pleura; while in but one only of these cases were there sub-pleural tubercles.

I have observed effusion of serosity into the abdomen in several other chronic affections besides phthisis. Leaving out of the estimate affections of the heart, in which this effusion is so common, I found it sixteen times in seventy-seven subjects, to the amount already indicated; that is, in about the same proportion of cases as in phthisis. The same may be said of acute peritonitis at the close of life, which I met with in four cases; three times in cancerous affections of the uterus, once in a case of dysentery. But not one of these seventy-seven individuals, nor of those observed later (numbering upwards of three hundred labouring under chronic disease), was affected with tuberculous peritonitis, nor exhibited semi-transparent granulations on the peritoneum, or in the substance of pseudo-membrane attached to its surface. This fact concurs, with those previously made known, in displaying the analogy of tubercles to semi-transparent matter,—one and the other appearing to exist in phthisical subjects only.

CHAPTER X.

THE BRAIN AND MEMBRANES.

Although the intellectual faculties almost always continue unaffected during the course of phthisis, and usually so even to the last hours of existence, still, in the majority of cases, some anatomical change of the brain and its appendages was discovered. I proceed to describe those I have observed.

In persons of advanced age the *dura mater* adhered more or less closely to the sagittal suture, and neighbouring parts, and presented, in many cases near the longitudinal sinus, or at a variable distance from it, certain slits, varying from two to four lines [4 to 8 millimeters] in length. These slits, round which the dura mater was separated from its attachments to a slight distance, gave passage to certain rounded bodies, of white colour, opaque or slightly semi-transparent, homogeneous, about a line [2 millimeters] in diameter, and two, three, four, or sometimes more in number. In some cases, the internal table of the bone had undergone attenuation or destruction opposite them to an extent of from one to two lines [2 to 4 millimeters] ; they were more or less adherent to the edges of the opening through which they passed, and less frequent in young subjects than in those who died at an advanced age.

These small bodies sprang from the upper surface of the *cerebral arachnoid*, and rarely from that division of the membrane lining the dura mater ; they were observed in the majority of individuals, with or without slits in the latter membrane. Limited to a space of three lines [6 millimeters] in width on either side of the median fissure, they were more numerous close to than at a certain distance from this ; their size varied between that of a millet-seed and of a small pea. Pretty frequently grouped together in the form of patches more or less rounded, or of irregular shape they were quite as commonly isolated. They adhered closely to the arachnoid ; and wherever

they existed, this membrane was more or less thickened or opaque. This circumstance, and the non-existence of these so-called glands of Pacchioni in a certain number of individuals, furnish motives for considering these little bodies as morbid productions. I shall henceforth speak of them under the name of "arachnoid granulations."

In some other cases the arachnoid was thickened and opaque, and free from granulations on the surface; while, in two cases, both kinds of alteration affected its entire upper half. In two other subjects I found shreds of yellowish, extremely soft, pseudo-membrane on its firm surface. This last morbid state was evidently of very recent origin, and showed that the arachnoid like the other serous membranes, is susceptible of acute inflammation during the closing days of existence, when emaciation and feebleness have attained their maximum.

There was a small quantity of limpid or reddish serosity—about from three to five small spoonfuls—in the upper part of the cavity of the arachnoid, in five out of ninety-nine subjects. (Cases VII, XX, XXIV, XV, LI.) Much more frequently (in about half the cases) I found one or two tablespoonfuls of the same fluid in the lower occipital fossæ; and, in all the cases in which I opened the spinal canal, there was a still greater quantity there.

Effusion of serosity into the *lateral ventricles* was no less common than sub-arachnoid infiltration (of which more by and by), and was directly proportional to it in quantity. The quantity in each ventricle varied between one and four or five tablespoonfuls. The serosity was generally limpid: I only found it turbid in three cases; and in none of these was there any alteration of structure of the corresponding arachnoid, or of the subjacent cerebral substance. It is to be remarked, besides, there was scarcely any effusion in cases of sudden death; which would lead to the belief that, in the greater number of cases, it is formed in articulo mortis (pendant l'agonie).

Except in one of the cases, in which the effusion was turbid, I did not notice any symptom referrible to it.

I found, in three cases, a tablespoonful and a half of limpid serosity in the *fifth ventricle;* and, in these three instances, the sub-arachnoid infiltration, and the serous effusion into the lateral ventricles, were proportionally as considerable, and had attained

the extreme amounts above mentioned. The walls of the septum lucidum were firmer than usual, and the arachnoid lining them apparently thickened.

In three fourths of the cases there was also an infiltration of serosity to a variable amount underneath the upper arachnoid; I shall call it, from its situation, sub-arachnoid. When existing to the lowest amount observed, it only occupied a part, generally the posterior half, of the space indicated. When more abundant, it extended over the whole surface into the interstices of the convolutions, and above these; so that the maximum depth of fluid opposite the latter was about one line [2 millimeters]. The deeper it was, the more easily were the arachnoid and pia mater detached. I besides found the *pia mater* more or less red, thickened, and injected, in twelve subjects, or in about one eighth of the cases; and six of these exhibited more or less marked injection of the substance of the brain.

The *cerebral substance* presented several alterations. In fourteen out of one hundred and one individuals, I found it more or less injected. In five cases its consistence was much less than natural; and, in one of these, had fallen to that of the brain of a new-born infant. In a sixth case, the softening affected only the left hemisphere; and, in these different cases, the duration of the pulmonary affection had varied from seven months to five years. In six cases I found the fornix, the septum lucidum, or the corpora striata, in a state of pulpy softening, (Cases II, VII, XV, XXV, XXVI,)without alteration of colour of the softened tissue, except in the case where the loss of consistence implicated the corpora striata.

Lastly, I have observed two other important morbid conditions in the brain of subjects cut off by phthisis—hydatids and tubercles. I have already given an example of the occurrence of the latter product in the medulla oblongata, (Case VI;) I shall relate another of the same kind, where the cerebrum and cerebellum were the parts affected, after having first detailed the particulars of the only case of hydatids I have observed.

Case VIII. A stone-cutter, aged 54, of spare habit, sober, laborious, and rarely ill, had for more than three years been subject to attacks of sore throat, which lasted from twenty-four to thirty-six hours; and for a still longer period, to diarrhœa,

inconsiderable in amount, recurring from month to month, lasting a day or two only, and unattended with colic pains. Six months before his admission into hospital, he had been seized suddenly, without any assignable cause, and without previous cough, with *vomiting of blood,* to the amount, as he calculated, of about three pints and a half [2 litres]; some days after, he passed blood in considerable quantity by stool. After these enormous losses of blood, he kept his bed several days, and was unable to work for three months. Cough and expectoration set in with the hemoptysis or shortly after; rigors, followed by heat and perspiration, had come on within the last two months, and within the same period the breathing had been laborious. The appetite had failed, the patient not having been able to eat meat from the outset; there had been but little thirst, and neither pain in the chest nor diarrhœa.

November 26th, 1822, (the day following the patient's admission.) *Present state.* Feebleness not very great; no headache; intellect fair; respiration calm, not deep; imperfect pectoriloquy between the spine and supra-spinatæ fossæ; respiration harsh and strong in the same places, natural elsewhere; cough not frequent; sputa nummulated, opaque, and mixed with a quantity of viscid fluid; shooting pains in the lateral parts of the chest; voice hoarse and cracked, as it has been for the last month; sensation of rawness in the larynx, during deglutition and cough; heat of skin natural; pulse calm, regular, beating less than 70 in the minute; appetite and tongue natural; but little thirst; deglutition difficult, although the pharynx and tonsils are perfectly healthy; abdomen free from pain; one stool, of moderate consistence, the day before.

Decoction of Iceland moss; pectoral infusion; gum potion; a fourth of house-allowance; four ounces of wine.

During the following month the patient's state appeared to improve; he felt himself better and had no rigors; the appetite grew sharper, and he was allowed half of house-allowance daily; nevertheless there was complete aphonia from time to time.

From the 24th of December to the 31st of January following, (the day preceding that of his death,) the intellectual faculties continued perfectly unaffected; he slept but little, had no headache, and lost strength very gradually.

The aphonia varied in degree; there was constant pain imme-

diately above the thyroid cartilage, accompanied with sensation of heat, more especially during the night; there was difficulty felt in swallowing the saliva; the pharynx and tonsils exhibited nothing unnatural.—The cough and difficulty of breathing increased during the first ten days of the month of January, but became somewhat less severe after the 15th; the sputa grew thicker. At the same time rather sharp pain supervened opposite the left mamma, without appreciable change in the sonorousness of that part of the chest; the respiration was tracheal, and accompanied with gurgling under the left clavicle over a space measuring six inches [15 centimeters] in height. The same phenomena were observed in the corresponding part of the back, but were limited to a smaller surface. On the right side there was a little mucous rhonchus,

The pulse retained the character of slowness first noticed; evening rigors followed by heat and sweating reappeared.

From the 26th to the 28th of December severe colic-pains were complained of; these were followed by diarrhœa, which continued, to a very considerable amount, from the 2d to the 10th of January, ceased on the 16th and 17th, and subsequently reappeared, but was limited to two or three stools per diem. The tongue continued natural, and the epigastrium free from pain to the last; the appetite failed from the first appearance of the diarrhœa.

On the 31st, the patient's feebleness suddenly became very considerable, and the face pale; he complained of a most distressing sensation of weakness at the epigastrium; the chest emitted no sound under percussion under the left clavicle, over a surface measuring six inches [15 centimeters] in height; the sputa resembled a greenish-gray *purée*, and were tinged of a pinkish hue at their edges; the pulse continued calm and regular. Some slight delirium occurred during the night, and the following morning, at three o'clock, the patient expired.

The food allowed was increased or diminished, according to the state of the appetite and powers of digestion. When the diarrhœa supervened, rice-ptisan sweetened with syrup of quinces, was ordered; subsequently diascordium, with three quarters of a grain [5 centigrammes] of opium, in eight ounces of infusion of catechu, when that symptom attained its height.

Sectio Cadaveris ; *twenty-nine hours after death.*

External appearances. Nothing remarkable.

Head. Dura mater very strongly adherent to the sagittal suture ; no sub-arachnoid infiltration. At the upper and lateral parts of the cerebrum, and underneath the pia mater there were seen about twenty vesicles protruding about one line or one line and a half [2 or 3 millimeters] beyond the convolutions ; the rest of their substance was sunk in the brain, which exhibited the characters of perfect health around them : these vesicles were of spherical form, and various sizes : three of them were as large as an ordinary hazel-nut, even on the surface, and provided with a sort of peduncle, from which sprang a whitish opaque membrane, partially covering the hydatid. The latter was mainly formed of a soft thin membrane, containing a fluid, which rendered water slightly turbid. The other hydatids exhibited the same structure, but were somewhat larger, and more or less tuberculated on the surface, so that some of them had the appearance of mulberries. The brain was highly vascular ; the lateral ventricles, the pons varolii, and the cerebellum natural.

Neck. Mucous membrane of the laryngeal surface of the epiglottis entirely destroyed ; the ulceration had rather thick, hard, whitish edges, and its surface was uneven, and tinged of a pink colour.—Two small superficial ulcerations, above the upper chordæ vocales, one of which (that of the left side) was almost completely destroyed. The edge of the destroyed part was grayish, hard, and lardaceous-like.—Mucous membrane of the trachea red, and slightly thickened inferiorly ; that of the bronchi still redder ; both free from ulcerations.

Chest. On the *left* side something less than a pint and three quarters [1 litre] of reddish serosity, in the midst of pseudo-membrane investing the lung, the diaphragmatic and costal pleuræ, exhibiting a bright red colour on its internal surface, and measuring half a line [1 millimeter] in thickness. At the apex of the upper lobe appeared a large cavity lined with a semi-cartilaginous pseudo-membrane, lying upon healthy pulmonary parenchyma, and in addition to this, tubercles and small masses of melanosis. In the rest of the lobe there were numerous cavities, the greater number of them partially emptied. The lower lobe contained a pretty considerable number of gray

granulations, without tuberculous matter or cavities.—On the *right* side the same morbid appearances (except the effusion and pseudo-membrane, which were altogether absent) existed as on the left side, but to a somewhat less amount.—Heart perfectly sound.—The aorta contained numerous cartilaginous and osseous patches below the origin of the cæliac axis. The femoral arteries were ossified, in the form of circular lines, running more or less accurately parallel to each other, and slightly prominent.

Abdomen. Mucous membrane of the stomach pink-coloured in some places, somewhat softened at the fundus, and in every part of proper thickness : it exhibited, to the left of the cardiac orifice, an ulceration, six lines [12 millimeters] in diameter, with edges somewhat irregular, and bevelled off, and a fundus formed of the submucous cellular tissue, thickened, and uneven on the surface. Mucous membrane of the duodenum slightly grayish, and otherwise perfectly healthy ; that of the small intestine natural, except that it presents two small ulcerations, exhibiting a few miliary semi-transparent tubercles on their surface. Mucous membrane of the large intestine as soft as mucus, and of violet-red colour in several places. Ten small submucous abscesses, of the size of small peas, in the rectum, together with eight ulcerations of the same size.—Spleen softened ; the other abdominal viscera present nothing remarkable.

The occurrence of hydatids in the brain is extremely rare, so much so, that at the period I observed this case, I had not seen a similar one. The hydatids were not completely invested by the cerebral substance ; one part of their body protruded forwards under the pia mater, wherein, doubtless, they originated. The healthy state of the brain around appears to attest the slowness of their development ; and the notion that such was their mode of progress is confirmed by the complete absence of cerebral symptoms during life. The patient had not suffered from the very slightest headache.

Except the hydatids of the brain, the other anatomical changes, in spite of their considerable number, had all given rise to the symptoms proper to each. The aphonia noticed depended upon the ulcerations of the larynx ; the pain below the thyroid cartilage, the difficulty of swallowing (the pharynx and tonsils being perfectly healthy), denoted, or, at the very

least, gave just motive for suspecting the existence of, ulceration of the epiglottis. The outset of the pleurisy had been signified by pretty sharp pains in the left side of the chest; pains as severe had occurred, with the manifestation of diarrhœa, —this had not lasted more than eighteen days, and yet that short period had sufficed to entail pulpy softening, perhaps even complete disorganization, of the mucous membrane of the colon. Still, in the midst of symptoms so serious, and at the outset of two inflammatory affections,—pleurisy and enteritis—both of which ran their course with rapidity, the pulse remained calm, and the temperature of the skin underwent no increase! And many are the facts of similar kind, which show that the physician, desirous of establishing his diagnosis with accuracy, should chiefly direct his attention to the local symptoms.

It is further to be noticed, among the interesting circumstances of this case, that the affection commenced by abundant hemorrhage, and that cough and expectoration only came on secondarily to this. In spite of the expression used by the patient, who declared he had *vomited* blood, and although intestinal hemorrhage apparently occurred a few days after the first attack, it is scarcely possible to entertain a doubt of the lungs having been the source of both discharges. In the first place, because hemoptysis is frequently the earliest symptom of phthisis, and is often so abundant that patients affirm they have vomited blood, though they have done nothing of the kind; secondly, because the state of the stomach was not one of those which give rise to hematemesis, and, besides, everything goes to show that, at the period of the hemorrhage, and for a long time subsequent to this, that organ was in the natural state; and, lastly, because blood passed by stool may very readily come from the lungs in consequence of having reached the stomach by deglutition.

Case IX. A young girl, aged 19, endowed with much intelligence and excellent memory, born of healthy parents, of rather weak constitution, of sanguineo-lymphatic temperament, and not very subject to catch colds, was admitted into the Hospital of La Charité on the 1st of October, 1822, having been then seven months ill. Her illness had commenced with rigors, dyspnœa, loss of appetite, thirst, and pulsative pain at the epigastrium.

The rigors had returned every day, more or less irregularly, for five months without interruption. The epigastric pain had been very nearly constant; the anorexia more or less complete; the thirst variably intense; neither vomiting nor nausea had occurred; the dyspnœa had made continual progress; cough and expectoration had set in within the *last three weeks* only, and twelve days before the patient's admission there had been a slight attack of hemoptysis. The catamenia, suppressed two months before the outset of the affection, had not since returned; and at each menstrual period she suffered from headache of much greater severity than usual at that time. The bowels had continued regular; loss of flesh became apparent coevally with the earliest symptoms.

October 1st. *Present state.* Intellectual faculties natural; no headache; respiration somewhat frequent; cough rare; sputa ragged; percussion sonorous over the whole chest; imperfect pectoriloquy between the shoulders; no thoracic pain; pulse 100; appetite moderate; thirst inconsiderable; tongue somewhat red; cervical glands enlarged and painful; tumour at the umbilicus, slightly inclined to the right side, almost free from tenderness, and of the size of a common apple; no epigastric pain; bowels constipated.

Fifteen leeches to the external genitals; gum potion; pectoral ptisan; three soups.

The succeeding days the appetite increased considerably; and the appearance of some streaks of blood in the sputa led to a second application of leeches.

10th. The patient complained of sharp pain in the right axilla, where a considerable mass of enlarged glands was found; she had some tendency to sleep, and the face was red and excited.

From the 20th to the 25th. Intense headache; face redder even than usual; frequent flushes of heat in the face, growing more troublesome than hitherto.

Twelve leeches, applied to the external genitals, on the 25th, produced no relief; the cough and expectoration had not undergone any obvious change; there was distinct pectoriloquy between the shoulders, and tracheal respiration under the clavicles; the abdominal tumour seemed to have increased in size.

November 4th. Some watery stools for the first time; night sweats, which first appeared three days before, still continued. Abdominal tumour painful.

V. S. to eight ounces [250 *grammes*].

From this period until the 26th of December, the day of death, the face was of a deep red colour, and eventually became blueish; occasionally some amount of somnolence was observed, or, on the contrary, insomnia and almost constant headache. The patient's strength rapidly failed, and she ceased to leave her bed.

The sputa, sometimes slightly viscous and aerated, became dull and stained with blood four and twenty hours before death; the dyspnœa increased very rapidly.—December 1st. The patient complained of a distressing sense of heat along the trachea, and this sensation subsequently recurred very frequently.

The rigors, which had occurred almost daily after the patient's admission, continued; the moment she fell asleep she was inundated, as it were, with perspiration; and progressively increasing doses of acetate of lead failed to lessen the severity of this symptom.

The diarrhœa remained persistently, sometimes accompanied with colic-pains; there was total loss of appetite from the 1st of December; but neither nausea, vomiting, nor any evident pain at the pit of the stomach. The thirst became very distressing towards the close; and on the 23d, the tongue, which had for a short time been whitish, or slightly red, became of crimson colour, and covered with a great number of small, white, opaque, almost miliary spots.

From the moment diarrhœa set in, the patient was put upon rice-water, sweetened with syrup of quinces; while suffering from insomnia she had small quantities of syrup of poppies, but with scarcely any good effect. Her diet consisted chiefly of rice-creams; and occasionally she took only a little broth.

Sectio Cadaveris; *thirty-three hours after death.*

External appearances. Some vibices; last stage of marasmus.

Head. At the posterior part of the right hemisphere of the brain, the arachnoid adhered to the dura mater, in the situation of an irregular shaped tumour, seated near the surface of the brain; this tumour was as large as a moderate-sized hazel-nut, of greenish-yellow colour, firm, dull looking, having, in a

word, the tuberculous character, and non-encysted; around it the cerebral substance was healthy. There were five similar tubercles between the upper surface of the brain and the lateral ventricle. On the left side there were four,—one of them at the postero-inferior part of the optic thalamus. At the base of the occipital lobe, on the same side, a portion of cerebral substance was converted into tuberculous matter, forming a lamella, four lines [8 millimeters] thick, and measuring four inches and eight lines [12 centimeters] in superficial extent. Part of this lamella adhered to the tentorium cerebelli, the corresponding lamina of which had undergone the same transformation. Lastly, at the lower part of the left hemisphere of the cerebellum was a non-encysted tubercle, of the size of a hazel-nut, stretching into the medulla spinalis, which was, to a certain extent, engaged in the disease.

Neck. Cervical glands very large, completely transformed into unsoftened tuberculous matter; larynx and epiglottis natural; mucous membrane of the trachea very red, especially its posterior surface.

Chest. A large mass, of the size of a goose's egg, of unsoftened tuberculous lymphatic glands in the right axilla.

Cellular adhesions of both lungs over their entire surface. Large-sized anfractuous cavity at the apex of the left lung containing a small quantity of red fluid, traversed by a great number of bands formed of grayish substance lined with a semi-cartilaginous pseudo-membrane, which lay upon tubercles and gray semi-transparent matter; the remainder of the upper lobe almost completely transformed into gray or tuberculous matter, and studded with small cavities, between which the pulmonary parenchyma was of deep red colour. There were crude tubercles in tolerable number in the lower lobe.—The same changes existed in the *right* lung, though to a somewhat less considerable amount; here two softened tubercles protruded externally.—The bronchi were of deep red colour, and communicated in several places with the cavities.—Heart rather small, but healthy; aorta natural.

Abdomen. About a pint and three quarters [1 litre] of light coloured serosity in the cavity of the abdomen.—Liver, a little enlarged, contained twelve cysts, varying in diameter from two to three and a half lines [4 to 7 millimeters], and containing a

greenish pulpy matter. Their walls were less than half a line [1 millimeter] thick, of grayish colour and but slight consistence. The tissue of the organ was itself perfectly healthy; the bile contained in the gall-bladder black, and as thick as treacle. —Mucous membrane of the stomach red, mammillated, of good consistence, over a surface of four inches and eight lines [12 centimeters] on its anterior wall; elsewhere pale, and very soft in some parts of the fundus.—Ten ulcerations, of from one to one and a half lines [2 to 3 millimeters] in diameter, in the duodenum. There were great numbers, too, of the same dimensions all along the small intestine, either on or between the glandular patches of Peyer, presenting somewhat prominent edges, and a fundus formed of thickened submucous cellular tissue. Mucous membrane of the large intestine red in the ascending colon,where there were two small superficial ulcerations; pale elsewhere, and throughout as soft as mucus. Mesenteric glands large, red coloured, and partially tuberculous. The tumour, felt during life at the umbilicus, was seated above the pancreas, equalled the clenched hand in size, and was formed of a certain number of tuberculized lymphatic glands. The mass was continuous inferiorly with the lumbar glands which had undergone the same transformation. In neither situation had softening set in—the spleen, of natural size, contained a great number of spherical tubercles, varying in size from that of a hemp-seed to that of a small hazel-nut. Other abdominal viscera healthy.

The development of tubercles in the brain and cerebellum is doubtless a less striking feature in this case than the simultaneous existence of those bodies in a great number of various parts, the lungs, the neck, the right axilla, the mesentery, the lumbar region, the spleen,—and more especially the fact of the tuberculous matter being in the same stage of development in all these places except the lungs.

I really do not understand how this fact can be accounted for, unless by admitting the agency of one and the same cause acting at one and the same time upon all these parts. For if, on the contrary, it be imagined that the ulcerations of the small intestine were the sole cause of the conversion of the mesenteric glands into tuberculous matter, how is the development of that matter in the axilla, the brain, and the spleen, to be accounted

for? And above all, what explanation can be advanced of the circumstance that the tuberculous matter was in the same stage, that of crudity, in every place where it existed, if the cause leading to its evolution be not admitted to have been uniform, and to have produced its effects simultaneously? Besides, whatever be the hypothesis adopted, the state of the small intestine can afford no explanation of the tuberculous transformation of the lymphatic glands seated above the pancreas, inasmuch as the tumour formed by them existed at the time of the patient's admission, long before diarrhœa came on, and consequently at a time when the mucous membrane of the small intestine was still healthy. And this statement cannot be characterized as an hypothesis; for the minute size and the structure of the ulcerations of the small intestine show sufficiently clearly that they were but recent at the time of the patient's death.

The small number of symptoms to which the tubercles of the brain gave rise is likewise a circumstance worthy of attention. We are scarcely justified in ascribing the increase of headache at the catamenial periods, and the flushes of heat in the face to their agency, for the pain apparently seated in the cervical glands may have been the cause, or at least played some part in the production, of those phenomena. If we further reflect that the intellectual faculties retained their clearness to the last, and that the powers of motion were unaffected, we shall see reason for allowing that these symptoms, even if they were the immediate effects of the tuberculous disease, were effects of very trifling importance. At the same time it will be admitted, that if tubercles and hydatids may be developed in a latent manner, in the midst of the brain, the same occurrence may, nay must, occasionally take place in the lungs; and we shall have no reason to be astonished that in certain cases phthisis remains latent for a variable time. And without going further than the present case, we have a verification of this proposition of the occasional latency of phthisis (hereafter to be further demonstrated by numerous examples;) for at the time of the patient's admission pectoriloquy was audible, and yet there had been no cough until within the few previous days! It is exceedingly probable here that pulmonary tubercles existed at the very outset of her illness, I mean when dyspnœa and febrile action manifested themselves; for as the most serious and earliest alteration of the

organs was that of the lungs, it alone can account for the existence of the earliest symptoms.

It is further important to remember, that tubercles of the brain and cerebellum, which are much more common in childhood than in adult age, are also, generally speaking, latent in children; and that cerebral symptoms, of any importance, scarcely arise in children affected with cerebral tubercles, except when softening, more or less extensive, of the brain supervenes in addition to the primary morbid state.

But the brain of phthisical subjects occasionally exhibits a morbid condition, of no less importance than that just described, —one to which my attention had not been directed at the period the former edition of this work was published, but which the labours of M. Rufz,[1] and those of Dr. Gerhard of Philadelphia, have especially familiarized us with. I refer to certain gray semi-transparent granulations, which occasionally exist in the substance of the pia mater, in subjects carried off by phthisis. These granulations, first made the subject of study in children, (in whom they are of frequent occurrence) were subsequently examined in the adult, (in whom they are, on the contrary, a rare production) by M. Lediberder.[2] The cases upon which this observer's descriptions were founded were, for the most part, collected in my wards at the Hospital of La Pitié. Though sometimes placed superficially under the upper arachnoid, these granulations are more commonly found in the anfractuosities of the brain, especially in the midst of the pia mater investing the fissure of Sylvius, (their favorite site, as the author just named observes,) and in the course of the middle cerebral arteries, along which they are sometimes collected in groups. Sometimes isolated, they are more commonly united together by a grayish matter, more translucent than themselves. In respect of size, they vary between a millet-seed and a hemp-seed. The largest of them are generally of a yellow hue in the centre, and they are pretty frequently associated, at the lateral parts of the brain, with yellowish patches, occasionally deposited beside the arteries in the form of bands. These bands might, on first sight, be taken for concrete pus; but attentive examination

[1] Thèse Inaugurale. [2] Diss. Inaug. Paris, 1837. No. 410.

shows that they are nothing more than accumulations of gray matter, containing granulations, and coloured with a little light yellowish serosity. M. Lediberder observes, that the anatomical changes now under consideration rarely exist to the same amount on both sides of the brain; and that in upwards of one half the cases, softening of the commissure of the optic nerves, or of some other part of the cerebrum, coexists with these granulations. Generally speaking, the alteration of the cortical substance is proportional to that of the pia mater.

The morbid changes passed in review in this chapter are not peculiar to phthisis: I have observed them in the victims of diseases the most various. Thus the so-called glands of Pacchioni existed in about the same proportional number of those cut off by all diseases indiscriminately on the one hand, and by phthisis on the other. In one hundred and fifteen cases, (in which I comprise no examples either of apoplexy, softening of the brain, or typhoid fever,) a trifling effusion of transparent or turbid serosity existed sixteen times in the upper part of the cavity of the arachnoid; and this effusion was of somewhat more frequent occurrence after chronic than acute diseases.

Nine times, in the same number of cases, I observed thickening and opacity of a variable extent of the upper part of the arachnoid; and, in four instances, thin shreds of different sizes, of soft yellowish exudation on its surface. Sub-arachnoid infiltration existed in two fifths of the cases, and was carried to at least as great an extent in individuals carried off by protracted acute diseases, as in the victims of affections essentially chronic, such as cancer, for example.—The pia mater was more or less thickened, red, and "engorged," in fourteen subjects; that is, in about the same proportion of cases as in phthisis,—and much less frequently than in persons cut off by cerebral diseases or typhoid fever, in the ratio of 2 : 7. In all these cases there was almost invariably vascular injection, to a greater or less amount, of the brain.—Effusion of serosity into the lateral ventricles was very frequently observed. I met with it ninety-two times, to various amounts, but always falling within the extremes mentioned already in the case of phthisis; it was almost always proportional in quantity to the sub-arachnoid infiltration. In cases of sudden death it scarcely amounted to two or three small

spoonfuls ; a fact which would appear to corroborate what I have said respecting the period at which the effusion commonly takes place.—In fifteen subjects the consistence of the encephalon was more or less diminished, though not to the amount observed in the case of the phthisical patients referred to. Of these fifteen cases, two only were furnished by individuals cut off by acute diseases ; and as the number of the latter was to that of chronic affections as 45 : 70, it is presumable that reduction of consistence of the brain is a phenomenon more particularly belonging to maladies of protracted course. Lastly, I observed six examples of partial pulpy softening of the brain, all of them in cases of some chronic affection or other.

Hence, whether softening of the brain were general and slight, or partial and carried to extremes, it was almost exclusively noticed in the victims of chronic diseases. This coincidence might lead to the conjecture that there is possibly, in some cases, a kind of analogy between one and other species of softening.

The changes of structure observed in the brain and its appendages were, then, the same in phthisis and other chronic affections ; many of them were, besides, discovered in protracted cases of acute disease : the only difference in these various classes of malady was one of frequency.

The only morbid changes I have observed exclusively in the brain of phthisical subjects are hydatids and tubercles. I do not consider the presence of those entozoa as constituting a morbid state peculiar to phthisis ; but all that has been said tends to show that such must be considered the character of tubercles of the brain and of gray semi-transparent grauulations of the pia mater.

SUMMARY.[1]

It is sufficiently obvious, from the contents of the preceding pages, that the lungs were not the sole organs rendered incapable, during the progress of phthisis, of performing their functions,—that others were, on the contrary, the seat of anatomical changes, so serious and extensive that these would, in themselves, have sufficed to destroy life,—and that almost all of them contributed, in a more or less obvious manner, to hasten the fatal issue of the primary disease. However, a rapid survey, in the form of a summary, of these various anatomical disorders, will give a clearer notion of their mutual bearings.

Recent inflammation, of variable extent, of one or both lungs, —or of the pleura, which was invested with false membrane, sometimes of tuberculous character,—or effusion of a notable quantity of limpid serosity into the pleural cavity, coexisted, in one tenth part of the cases, with pulmonary tubercles and cavities.

The trachea exhibited ulcerations, oftentimes of enormous size, in somewhat less than one third of the cases. The mucous membrane was simply of more or less bright red colour, and sometimes a little softened or thickened in one fifth of the cases.

Ulcerations of the larynx presented themselves in somewhat less than a fifth part of the subjects. Those of the epiglottis were scarcely less frequent.

The pericardium contained a notable quantity of perfectly clear serosity in the tenth part of the individuals examined, and exhibited traces of former or recent inflammation in several others. The heart was pretty frequently softened; the aorta red in the majority of young persons, its structure more or less seriously altered in those aged upwards of forty.

In one twelfth part of the cases the stomach was very much

[1] This Summary is founded both upon the cases given in my former edition, and upon those which are analysed, for the first time, in the present.

distended, and placed lower in the abdomen than natural; its mucous membrane was red, sometimes mammillated, slightly softened and thickened, on the anterior surface, in about the same proportional number of cases. In a fifth part of those examined it was softened and attenuated, within a variable extent; and in the same number of individuals it was found extremely red, softened, and sometimes thickened at the fundus; ulcerated, and more or less grayish and mammillated in many others, &c. It was perfectly healthy in but one fifth part of the cases.

Five sixths of the bodies examined presented ulcerations, varying in number and size in the small intestine. They were of almost as frequent occurrence in the large intestine, and the mucous membrane of this portion of the alimentary canal, frequently coloured red and thickened, was as soft as mucus throughout the entire, or a great part, of its extent in one half the cases. I found it perfectly healthy from one end to the other in but three cases.

Transformation of the lymphatic glands into tuberculous matter was less frequent in the neck, in the lumbar regions, in the meso-colon, and in the axillæ, than in the mesentery, where it existed to various amounts in one fourth of the subjects. It was more frequent in the bronchial glands than in any other bodies of this class.

The liver was fatty in one third of the cases. The walls of the gall-bladder were sometimes thickened and ulcerated; and under these, as also under other, circumstances, the gall-bladder itself contained calculi.

The spleen was softened, and either larger or smaller than natural in a great number of individuals. It presented tubercles in a sixth part of the cases.

The kidneys were tuberculized in about the same proportional number of cases as the spleen; they occasionally contained serous cysts.

In several subjects the prostate gland was transformed, more or less completely, into tuberculous substance. In one of these persons exhalation of that substance had taken place into the interior of the vesiculæ seminales and the vasa deferentia. In three instances I found the most superficial stratum of the interior of the uterus converted into tuberculous matter.

There was an effusion of transparent serosity, to the amount of from one pint and three quarters to ten pints and a half [1 to 6 litres], in the abdomen of one fourth part of the subjects; and a small quantity of thick pus, or some false membrane, in the cavity of the pelvis in four cases. In six out of thirteen cases of tuberculous peritonitis, the great omentum and the meso-colon presented a mixture of semi-transparent blueish-gray matter, and true tuberculous substance.

The cerebral lamina of the arachnoid had very frequently undergone partial thickening, and exhibited non-tuberculous granulations, in greater or less number, at its upper part, more especially in the neighbourhood of the falx. It was invested, in two cases, with a yellowish soft false membrane. The tissue, uniting it to the pia mater, was infiltrated, and the lateral ventricles distended with a notable quantity of serosity in three fourths of the cases. The same kind of fluid appeared, but in less quantity, with somewhat less frequency also, in the lower occipital fossæ. In some cases the sub-arachnoid tissue, especially that in the fissure of Sylvius, was the seat of a greater or less number of gray semi-transparent, or actually tuberculous, granulations.—The brain was more or less injected with blood in one seventh of the cases; in one twentieth of them its consistence was diminished throughout, and in one instance more especially, to a very remarkable amount. It was affected with partial pulpy softening in the same proportion of cases; and in a small number of instances contained tubercles.

All the serous membranes, the arachnoid, the pericardium, the pleuræ, and the peritoneum, were, consequently, in a great number of phthisical subjects, the seat of a more or less abundant accumulation of fluid; and the lateral ventricles of the brain constituted its most frequent seat, at least when existing to any notable amount. These membranes were also the seat of acute inflammation at the close of life—the pleuræ much more frequently than the others—and the false membranes investing them were sometimes tuberculous.

In certain cases several of the morbid changes now enumerated might (as has been already said) independently of the condition of the lungs, have destroyed life in those presenting them. Notwithstanding this, other alterations occasionally coexisted with all these; and I have related the history of an

individual in whom every organ, with the exception of the kidneys, was more or less deeply diseased. (Case VII.)

The period of origin of these various anatomical changes varied materially: some of them—pneumonia, pleurisy, softening and redness of the mucous membrane of the fundus of the stomach, pulpy softening of that of the colon, acute peritonitis, arachnitis, partial pulpy softening of the brain—set in at the close of life. The majority of them were inflammatory,—a circumstance showing that feebleness was less an obstacle to, than a condition promoting, the development of inflammation. The others originated at some more or less remote period from the fatal event, sometimes at the very outset of the disease; such were the vast intestinal ulcerations in some cases, (Case IV,) the tuberculous granulations of the meninges and the chronic peritonitis in others.

These textural changes were, in a certain point of view, of two kinds: some of them appeared proper to phthisis, others were quite independent of its influence, and existed in different degrees in chronic diseases of all kinds: among the former are ulcerations of the larynx, and more especially those of the trachea and epiglottis, ulcerations of the small intestine, and fatty disease of the liver. So true is this, that the detection of an ulceration in one of the organs just named, &c., might, independently of all further investigation, be considered as the certain announcement of the individual presenting it having died phthisical.

The mode of production and of formation of these ulcerations was in many points similar, whatever might have been the situation they occupied. As soon as the mucous membrane was destroyed the submucous cellular coat underwent thickening to a greater or less amount, and became uneven; after a certain time it ulcerated, and now the muscular tunic in its turn commenced to thicken; this tunic eventually underwent destruction likewise, but only partially, and it was extremely rare to find it completely destroyed in any given point. Hence it appears that, in proportion as each additional membrane of the ulcerated part disappeared, the subjacent one thickened, thereby threw a certain amount of resistance for a certain time in the way of the destructive process, and so retarded the final catastrophe.

Another morbid state proper to phthisical subjects consisted in the presence of tubercle, or the gray semi-transparent gra-

nulation, or the gray matter in masses. Whenever these products presented themselves, I have never observed them in any organ without their being, likewise, present in the lungs,—I speak, be it remembered, of observations made on individuals who had passed their fifteenth year. Whence the apparent conclusion that their existence in the lungs forms a necessary condition for their development in other parts. There is another fact which appears further to demonstrate the reality of this connexion between the lungs and other organs, in respect of tuberculous development, or, at least, to demonstrate the agency of some one single cause acting at the same time on a great number of parts of the body :—it is, that, with the exception of one solitary case, I have always found the tuberculous deposit in a state of greater advancement in the lungs than elsewhere, and that when tubercles existed in various other parts of the system, besides the lungs, they had in all those others attained the same amount of development. Now it would be difficult to conceive this uniformity, in parts the most remote, and the most different in structure, from each other, without admitting the action of a single cause, acting simultaneously on a great number of parts, and quite independently of the accidental influences which we may in some cases be induced to recognize.

The general law now stated,—that, after the age of fifteen, tubercles do not present themselves in any organ without being likewise seated in the lungs,—is assuredly one of the most important and eminently practical in the whole range of pathology. It allows us, as we shall hereafter see, to recognize the existence of pulmonary tubercles in cases where, unless with its aid, it would be utterly impossible to do so : again, it enlightens the surgeon ; it warns him to forbear from the removal of a tumour, either suspected or actually ascertained to be tuberculous, (even though the subject do not suffer from the symptoms of phthisis) unless, after the maturest consideration,—unless, too, the operation necessary for the removal of the tumour were of slight importance, and unless the existence of that tumour must, within a short period, necessarily lead to the patient's destruction, &c.

However, as my object is not to support any given opinion, as such, rather than another, I am desirous of adding that I have

met with an exception to the general law in question. The individual furnishing it died of typhoid fever. There were no tubercles in the lungs, and yet there was a small quantity of tuberculous matter in one of the mesenteric glands.

I have met with another exceptional case since the publication of the former edition. A third has been recorded in a contemporary journal;[1] in this instance the lungs of a subject, aged twenty, were, upon close examination, found to contain not even the minutest granulation or tubercle; whereas there were some of these bodies in the brain and cerebellum. But these infinitely rare exceptions do no more than throw into stronger relief the importance, and almost universality of the law.

[1] Gazette Médicale de Paris, 1839.

PART II.

I SHALL devote this Second Part to the description of the Symptoms of Phthisis; its various complications, and the varieties it occasionally presents, in respect of acuteness or latency of progress. I shall also detail the facts bearing upon the subject of Perforation of the Lung, and of Sudden Death, and then pass to the consideration of the Diagnosis and Prognosis of the disease, as likewise of the Causes which are more or less generally regarded as favorable to the generation of Pulmonary Tubercle.

CHAPTER I.

SEMEIOLOGY.

IT has been seen, in the former part of this work, how rarely a case of phthisis presents itself in which the whole disorder is confined to the lungs; and it might be thence inferred that the one hundred and twenty-three cases I have collected, do not supply the necessary elements for a description of the *simple* disease. But, it will be admitted, that many of the alterations of structure described, such as ulcerations of the trachea, larynx, and epiglottis, of the small and large intestines, fatty transformation of the liver, &c. cannot be correctly regarded as complications; inasmuch as these anatomical changes being peculiar to, form, as it were, essential parts of, the disease. And I may remark further, that certain affections occurring at the close of life, such as pleurisy, pneumonia, &c., do not deprive the main disease of its character of simplicity; so that, in truth, instead of being confined to a very few, I am enabled to base my general description upon a great number of, cases.

In order to introduce some method into the detail of symp-

toms, I shall, in imitation of Laennec, divide the course of phthisis into two principal periods: the one previous, the other subsequent, to softening of the tuberculous matter, and its evacuation through the bronchi.

First period. In the majority of cases the disease set in without assignable cause. One third of the patients ascribed the earliest symptoms to sudden changes of temperature from hot to cold, to which they were exposed in following their various occupations,—to draughts of air, to having plunged their feet into cold water,—or having drunk cold water when heated. But the majority—those who referred their illness to draughts of air, and changes from hot to cold, to which they were exposed habitually by their occupations—were far from doing so with any degree of positiveness; in fact, they merely conjectured that such must have been the cause of their malady, in obedience to the popular belief that no disease of the chest can arise without sudden chill. So true is this, that in almost every case, when close inquiry was made into the dates of the alleged chill, and of the outset of the affection, it almost invariably turned out that a period of fifteen days, or a month or more, had elapsed between the two events. A very small number of patients referred (with a fair amount of precision) the occurrence of the first symptoms of *cold* to twenty-four, thirty-six, or forty-eight hours after the action of the cause to which they ascribed it.

Whether there did or did not exist apparent causes of the disease, the affection commenced by cough, generally a slight one; and the patient at first gave it no attention, believing it the effect of a simple cold, to which many of them were subject. This cough was generally accompanied with colourless expectoration, resembling frothy saliva; or (as was observed in one tenth part of the cases) the cough continued dry for one or more months, and, in some subjects, it occurred in paroxysms, and rapidly grew severe. After a variable lapse of time the sputa lost their colourless appearance, and became slightly greenish, and somewhat opaque. They changed completely in aspect with the arrival of the second period.—In some cases the earliest symptoms were preceded by hemoptysis of greater or less severity, or they set in with this hemorrhage, or, as was more usual, were followed by it. The breathing was not obviously obstructed at first; nor did the dyspnœa become troublesome in a certain

number of subjects, until a somewhat advanced period of the disease. In many cases pains of variable acuteness were felt in the shoulders, or between the shoulders and in the sides, some time after the outset, or very shortly after this, when the disease ran a rapid course. Pleuritic effusion occurred in some patients.—When auscultation was practised during this first period, the respiratory murmur did not always appear altered, at least when there were only gray granulations present. But in a tolerably large number of patients, the respiration was feeble under one or other clavicle, or somewhat rasping and harsh ; and in the same situation, within a limited space, there were a few clicks of crackling rhonchus, or some sub-crepitant or sonorous rhonchus heard, and the chest emitted a less clear sound under percussion than on the opposite side.

With these symptoms, which may be called local, coexisted more or less disturbance of the various functions of the system. Occasionally alternations of heat and cold, or even night sweating, were observed from the outset ; but these symptoms did not usually declare themselves so early as this, not indeed until the second period. The pulse was more frequent than natural. With the exception of a few cases, the appetite continued at first almost as good as previously to the appearance of the earliest symptoms ; it then diminished progressively. If the cough were violent, vomiting occasionally occurred after meals ; but when this was the sole cause of vomiting, that distressing act lasted but a short time. But few patients had diarrhœa ; still fewer some abdominal pain, with other evidence of chronic peritonitis. Loss of strength advanced with variable rapidity ; emaciation began to exhibit itself shortly after the outset, and at first made but slow progress.

Second period. The cough now became usually more frequent and distressing than before, more especially by night ; the sputa greenish, streaked with yellow opaque lines, free from air, assumed a peculiar (more or less globular) form, and became ragged at the edges, It was a tolerably frequent occurrence, to observe the majority of these characters disappearing under the influence of regimen and diluents ; but, sooner or later, they returned again. During the closing days of existence, they not uncommonly exhibited the appearance of a greenish and grayish *purée;* and lastly, they were often accompanied with sputa of the

character noted during the first period. Hemoptysis was of rather common occurrence, but, generally speaking, was of slight amount; the increase of dyspnœa was slow or rapid according to the progress of the disease; there was frequently sharper pain during this than the first period. Sometimes, indeed, intense pleuritic symptoms, requiring very active treatment, supervened. The patients almost always lay with their heads low; their mode of decumbency varied, though in a pretty large number of cases they lay exclusively on the side opposite the large cavities. By auscultation, pectoriloquy more or less perfect, gurgling rhonchus or tracheal respiration were detected in one or several spots of the upper regions of the chest; and in one third part of the cases, percussion elicited no sound over a space, generally of considerable extent, under one or other clavicle. It was during this period also that the symptoms proper to the various alterations of the mucous membrane of the stomach, and to ulceration of the epiglottis and larynx supervened,—alterations which are too often the sources of protracted and inexpressible anguish.

In the majority of subjects the fever was continued with exacerbations. These exacerbations occurred in the evening, and consisted generally of rigors more or less violent, followed by heat and perspiration. Unless when the progress of the disease was very slow, thirst to an urgent degree was felt; the appetite decreased as the strength, and was irregular, or in some cases a state of complete anorexia came on, although the mucous membrane of the stomach was perfectly healthy, or exhibited only slight and recent morbid change. In a small number of individuals also the alvine evacuations continued regular to the very close; several had no diarrhœa until the last twenty or thirty days of life; but in the majority of instances this symptom set in at a period long anterior to the final catastrophe. In some subjects symptoms of chronic peritonitis were observed, as we have already seen to be the case during the first period. Emaciation made rapid progress, and unless some particular accident occurred, such as perforation of the lung, &c. the patients died in the last stage of marasmus; they retained to the last the full exercise of their intellectual faculties, unless in certain cases where the development of serious disorders in the meninges modified materially the symptomatic characters of the disease, and hastened its final termination.

Fourteen patients out of one hundred and ninety-three, or somewhat more than one fourteenth of the whole number, died within a period of from twenty-two to eighty-four days! All, or nearly all persons attacked with phthisis, perish its victims! And the great majority of persons thus cut off are young, or even in the very prime of youth! Here are indeed pressing motives to encourage us to the study of the disease, to the investigation of its progress, of its causes, and of the multitudinous circumstances capable of influencing its development.

The duration of each of the two periods was very variable, but proportional to that of the malady itself. The following table, which gives the duration of the disease in one hundred and ninety-three cases, displays the limits within which that duration may vary.

Duration of the Disease.	Number of Deaths.	Duration of the Disease.	Number of Deaths.
22 days	1	10 months	7
24 —	1	11 —	8
30 —	1	12 —	8
35 —	1	12½ —	1
39 —	2	13 —	2
40 —	1	13½ —	1
45 —	1	14 —	6
50 —	1	14½ —	1
60 —	1	15 to 16 —	5
70 —	1	17 to 18 —	4
75 —	1	19 —	4
80 —	1	20 —	3
84 —	1	21 —	2
3 months	5	23 —	3
3½ —	2	24 —	10
4 —	15	28 —	1
5 —	10	30 —	1
5½ —	2	36 —	5
6 —	18	39 —	1
6½ —	1	48 —	5
7 —	8	60 —	4
7½ —	1	66 —	1
8 —	13	72 —	4
8½ —	1	84 —	1
9 —	13	90 —	1
9½ —	1		89
	104		

That is to say, that, of one hundred and ninety phthisical subjects, in whom the duration of the disease was fixed with all attainable precision, three died in one month; one in less than a month; eleven, in from thirty-five to eighty-four days; fifty-two, from the third to the sixth month; sixty-two, or nearly one third of the whole, from the seventh to the twelfth month, both included; forty-one, from the thirteenth to the twenty-fourth month, both included; and the twenty-three remaining patients, from the beginning of the third year to the middle of the eighth. These proportions differ but little from those deducible from the series of one hundred and fourteen cases, published in the former edition of my work; the duration of these cases was as follows:

Duration of the Disease.	Number of Deaths.	Duration of the Disease.	Number of Deaths.
24 days	1	11 months	2
35 —	2	12 —	5
50 —	1	12½ —	2
52 —	1	13½ —	1
81 —	1	14 —	3
3 months	2	14½ —	1
3½ —	3	15 —	5
4 —	2	17 —	2
4½ —	2	18 —	1
5 —	9	19 —	1
5½ —	2	20 —	1
6 —	7	2 years	8
6½ —	1	2½ —	2
7 —	8	3 —	4
7½ —	5	4 —	6
8 —	4	5 —	2
9 —	7	10 —	1
9½ —	1	12 —	2
10 —	3	14 —	1
10½ —	1	20 —	1
	63		51

Phthisis may then obviously, as I have just said, carry off its victims with frightful rapidity; and unfortunately the numbers so carried off form by no means an insignificant minority.

The mortality caused by phthisis was to that produced by other diseases, very closely, as 1 : 2; that is, of the three

hundred and fifty-eight subjects who expired in the course of three years and a half in M. Chomel's wards, one hundred and twenty-three died of phthisis, and two hundred and thirty-five of other affections: and if to this number of phthisical subjects we add forty others, who, though cut off by other diseases, had tubercles or tuberculous cavities in the lungs, we shall find that, out of three hundred and fifty-eight individuals, one hundred and sixty-three, or very nearly one half of the whole number, had tubercles in their lungs at the time of death—in other words, died phthisical. An enormous proportion, in truth; yet far from being that of all individuals destroyed by affections which, as far as present experience goes, are necessarily mortal.

We may now proceed to the full consideration of the symptoms, which I have so far only enumerated.

SECTION I.—COUGH.

The characters of the cough varied much. In some patients this symptom did not appear till the last days of existence, (Cases LIV, LV,) although they had had tuberculous cavities in the lungs for a certain time. In other cases, few in number, however, the cough was very slight; or after having existed a variable time ceased altogether, to return only a few days before death. (Case LIII.) The majority of patients complained of distressing cough, especially by night, and obtained no rest, except under the influence of opium,—nor did this even always produce the desired effect. The cough, in some instances, came on in paroxysms, excited a great deal of dyspnœa, and frequently, also, vomiting and distressing sensations at the epigastrium: generally speaking, its violence and frequency were proportional to the greater or less rapidity of progress of the disease.

Mental excitement, or moving about too frequently or too rapidly, or, indeed, violent movements of any kind, increased its severity and frequency: and we have already seen, that in some cases, at a certain period of the affection, the patients were utterly unable to lie on the side of the chief cavity, from the increase of cough such position entailed. This circumstance may consequently aid the observer, without the use of auscultation and

percussion, in ascertaining which side of the chest is most affected. Can the increase of cough thus produced be ascribed to the circumstance of the fluid contained in the cavities being emptied from them with greater difficulty in that position, than when the less-diseased side is lowermost?

SECTION II.—SPUTA.

The transition form the first to the second period was marked, as I have already said, by a notable change in the aspect and form of the sputa. Instead of being white, mucous, and most commonly containing bubbles of air, they acquired a greenish and opaque appearance, ceased to contain air, and became streaked with yellow lines, sometimes giving the sputa themselves a variegated aspect. If auscultation were practised while such was their condition, more or less marked resonance of the voice, pectoriloquy, or very strong tracheal-like respiration, often accompanied with gurgling, and sometimes with a large dry crepitant rhonchus, were discovered at the apex of the lungs. Among the sputa were also occasionally found particles of white opaque matter, resembling, as Bayle has remarked, boiled rice; but these particles were of rare occurrence, and existed in a much less number of cases than the streaked variety of sputum.

After a variable lapse of time, the streaked sputa, as well as the particles of white matter, ceased to be observable; the sputa became homogeneous, with rounded form or ragged edges. They were heavy and more or less consistent, yet did not always sink to the bottom of water; and, indeed, were not unfrequently seen floating on the surface of a clear fluid, which the patients expectorated with them. Having retained the greenish yellow colour, for a variable length of time, they assumed a dirty grayish tint, resembling that of matter contained in tuberculous cavities of old standing. This change occurred during the closing days of life,—fifteen or twenty, generally speaking, only a few days before death. They then lost their previous amount of consistence in some measure, spread out flat on the spitting vessel, and formed a sort of *purée*; they were sometimes stained with blood, or surrounded with

a pink-coloured halo. This last colour would no doubt be more frequently observed than it actually is, did all patients expectorate during the last twenty-four hours of life; for, on examination after death, the matters found in the bronchi are generally more or less red.

Taken together these characters of the sputa may, independently of all ulterior examination, be considered to denote, almost with certainty, the existence of tuberculous excavation of the lungs. I say, when taken together; for green, homogeneous, opaque sputa exist in chronic pulmonary catarrh, sometimes even in the acute variety,—but they are not striated in those affections—do not contain any of the white particles described, and are not usually nummulated like those of phthisical patients. The globular form is certainly one of their most important attributes, in respect of diagnosis, and in two very remarkable cases (Cases XXXVII, LIII) it was the first circumstance which led M. Chomel and myself to recognize the tuberculous disease.

However, I must remark, that I have, in two cases, seen the sputa nummulated and opaque during the closing days of life, although the lungs contained neither tuberculous cavities nor tubercles, nor were the bronchi dilated.

The characters I have described were found in every case except three; in these the sputa were invariably mucous, aerated, whitish, or very slightly yellow, or, on the other hand, grayish, semi-transparent, and vitriform: here they did not present the nummulated form at any period of the affection.

In the majority of cases the greenish, opaque, and striated sputa were associated with others of mucous character, more or less aerated, occasionally viscid, and, in a word, retaining the peculiarities of the first period. Or, if this latter kind of expectoration did not exist, the opaque green sputa floated in the midst of a clear thin fluid, like saliva. Sometimes they were unassociated with fluid of any kind.

The quantity of expectoration varied at the different periods of the disease. During the first, when the progress of the affection was rapid, the sputa were sometimes very abundant; the patients then filled one or two spitting vessels in a day,—or a quantity, ranging from about ten to twenty ounces [300 to 600 grammes]. During the second they were less copious, unless a consider-

able quantity of those of the first period coexisted with the expectoration more peculiar to the second: under the contrary circumstances it happened pretty frequently that they scarcely covered the bottom of the vessel, and I have never known them sufficiently abundant to fill it completely. There were a small number of patients who only voided a few sputa in the course of the twenty-four hours. Complete suspension of expectoration, for several successive days, occurred in two cases; and a female who died after croup,[1] with large tuberculous cavities in the lungs, and who had been ill for nine months when she fell under my observation, did not expectorate at all at any period of the disease. The pains I took in interrogating the patient upon this point place the fact beyond the reach of doubt.[2]

During the second period of phthisis, patients are occasionally observed to void an enormous quantity of puriform sputa in a very short time, under circumstances which do not permit us to suppose that a mass of softened tubercle can have suddenly made its way into the bronchi, and been the source of the expectoration. Such cases have been observed by a good number of practitioners, and, I doubt not, have too frequently led to the belief, when there was coexistent effusion in the corresponding pleura, that the matter thus suddenly evacuated came from the latter source. I myself observed a coincidence of the kind about a year since, at the Hospital Beaujon; but besides that the patient, who had voided the enormous quantity of liquid and puriform sputa in question, had not experienced the symptoms of perforation of the lung, the height of the effusion underwent no change after the evacuation through the bronchi; this would evidently not have been the case if the pleural collection had been the principal source of the expectorated matter. I am, for these reasons, induced to believe that a momentary increase of secretion into the cavities, and the communicating bronchi (which are commonly the seat of violent inflammation), will suffice for

[1] See Case VI of my Essay on Croup in the Adult, in Mémoires ou Rech. Anat. Pathologiques. Paris, 1826, p. 226.

[2] But, it may be asked, must not this woman have been one of those few persons who arrive at adult age without being able to spit, and who swallow their sputa, like children?

the production of those attacks of abundant expectoration, that gave origin to the belief in the so-called vomicæ.

As shreds of the tuberculized bands traversing them, and also calculous concretions, are sometimes found in the interior of pulmonary cavities, there would be no motive for surprise, as has been remarked by M. Andral, did we occasionally find such substances associated with the ordinary materials of expectoration. But such cases are, in reality, of rare occurrence. I have neither observed one in hospital nor in private practice; yet in private, as is well known, the persons in attendance upon patients preserve everything connected with their excretions with singular care.

After having been of greenish colour, and opaque aspect, &c., for a greater or less length of time, the sputa generally lost some of their bad characters under the influence of repose, regulated diet, or abstinence, and diluents; they became less opaque, had occasionally something of a vitreous look, and retained or lost their globular form. But they recovered their previous qualities after a variable period.

During the first period of the disease, while they continued mucous, and contained air in greater or less abundance, while neither gurgling nor pectoriloquy were yet discoverable, and hence no cavity was present, the bronchi must have been the source of supply of the sputa. Subsequently, during the second period, they were at once the product of secretion from the air-passages and from the tuberculous cavities. The proof of this appears, in the fact of the change supervening in their qualities as soon as pectoriloquy and gurgling announced the breaking down of the tubercles, and the establishment of communication between them and the bronchi; the resemblance of the yellowish streaks to liquid tuberculous matter, as commonly found in recently formed cavities, gives further evidence in the same direction. At a still later period, it was equally clear that the expectorated matters must have come from both these sources. For, in the first place, in a pretty considerable number of cases, matter perfectly similar to that contained in the cavities is formed in the neighbouring bronchi;—secondly, the substance of the expectoration, during the closing days of life, does not obviously differ from the contents of the cavities;—thirdly, the differences, which are so commonly noticed in the results of auscultation before and after expectoration, involve the occurrence of some

change in the quantity of fluid contained in the cavities ;—fourthly, it is impossible that cavities which communicate freely with the bronchi by a variable number of openings, can do otherwise than pour into these a part of the fluid they contain, each time a fit of coughing occurs ;—and, fifthly, the situation of a certain number of these openings, at the most dependent part of the cavities, shows that such passage from the excavations in the lungs into the bronchi perhaps frequently takes place under the simple influence of gravity.

These considerations still further derive corroboration, in a considerable number of cases, from the pathological condition of the bronchi. We have, in truth, already seen that when they are very red and thick, it is not in the neighbourhood of masses of gray or tuberculous matter that they are so, but in that of cavities ; a circumstance which appears to be only explicable by admitting that the passage of the contents of the cavities into the bronchi is more or less constantly going forward.

Still it appears to me indubitable that violent inflammation of the mucous membrane of the bronchi, at this period of the disease, must materially contribute to the production of changes in the expectorated matters ; that, further, the opaque, greenish, and grayish sputa are, at a certain time, as much the result of secretion from the mucous membrane of the bronchi as from the walls of the cavities ; and that there is but little or no difference between the matters furnished from both these sources.

SECTION III.—HEMOPTYSIS.

Hemoptysis, to a greater or less amount, occurred in two thirds of my cases, or in fifty-seven of eighty-seven individuals.

By severe or copious hemoptysis I understand such discharge as shall within a short space of time—a few minutes, quarter of an hour, half an hour, or an hour—give rise to the evacuation of from about two to three ounces [60 or 100 grammes] and upwards, of more or less fluid and spumous, or occasionally blackish and coagulated blood,—this evacuation being in some cases accompanied with contractions of the diaphragm, whereby the patients are led to suppose they have vomited the fluid dis-

charged. Hemoptysis is, on the contrary, slight, when only a few mouthfuls of spumous blood, either pure or mixed with sputa, are voided; and such hemoptysis sometimes lasts for several successive months. The number of patients having suffered from each of these varieties was about the same; of the fifty-seven subjects referred to, twenty-five had the severe variety of the symptom.

Either in its severe or slight form hemoptysis sometimes occurred a variable length of time before the appearance of cough or expectoration. Such was the case with twelve of my patients, eight of whom had had severe hemoptysis. This form set in still more frequently than the other in the course of, or at the commencement of the first period of the disease, in the proportion of 9 : 7. Spitting of blood occurred but rarely towards the close of life, when the patient's feebleness had reached its maximum. I have observed it at that period, in four subjects, an equal number of times in its severe and slight forms; in none of them did it prove fatal. However, such is not always the case, and since the publication of the former edition of this volume, I have observed three instances of fatal hemoptysis in about three hundred cases of phthisis, the direct cause of death being the obstruction of respiration produced by the abundance of effused blood. So that hemoptysis, which is frequently the first symptom of phthisis, is also occasionally the last; and in very rare cases we might conceive its being at one and the same moment the first and the final evidence of tuberculous disease.

It is a point of much interest to decide whether hemoptysis preceding cough and expectoration should be considered a harbinger of tubercles, or a symptom disclosing their actual presence. For upwards of fifteen years I have made it an invariable habit to inquire of every patient submitted to my observation, and not affected with tuberculous disease, if they had had spitting of blood at any period of their lives. I have always had an answer in the negative, except from some individuals who had had severe contusion of the chest, or from women whose catamenia had been suddenly suppressed. Further, I have observed some persons who, although they had a certain number of tubercles in the lungs, suffered from no symptom indicative of their presence, or simply laboured

under general symptoms; hence, nothing can be more natural than to find pulmonary tubercles giving rise at a certain period of their existence to a single symptom, and among the rest the spitting of blood. For all these reasons, I am of opinion that hemoptysis, if it be somewhat severe, and have not occurred under the exceptional circumstances alluded to, denotes with infinite probability, no matter what have been the period of its occurrence, the actual presence of some tubercles in the lungs. I do not say that it does so with certainty, for several cases, of the correct observation of which no doubt can be entertained, appear to constitute fortunate exceptions to the general rule.

I am well aware that Broussais did not confine himself to denying that hemoptysis was the effect, or denoted, as a matter infinitely probable, the existence of pulmonary tubercles, but that, in his opinion, a *multitude* of causes, besides tuberculization, might bring on hemoptysis, and that Laennec, in making pulmonary apoplexy the cause of hemoptysis of any severity, had been much more correct than myself. But this assertion on the part of the illustrious inventor of auscultation is an erroneous one, for pulmonary apoplexy is frequently met with in the bodies of individuals who have had no hemoptysis during life, and the converse is not less common. I may add, that pulmonary apoplexy was very frequently found in the bodies of those carried off by the epidemic yellow fever of Gibraltar in 1828; whereas not a single individual (I obtained most accurate information on the point) had had hemoptysis at the time. Again, I have very often, during the last fifteen years, had occasion to observe phthisical patients while actually suffering under severe hemoptysis, or very shortly after, and in no case did I discover the symptoms pointed out by Laennec as those of pulmonary apoplexy. Unless, then, we determine to set aside altogether the evidence of facts, it is impossible, as it appears to me, not to admit that with a few, unfortunately too rare, exceptions, hemoptysis, when at all severe, denotes tuberculous disease of the lungs.

The extreme importance of detecting phthisis at the very outset is my motive for thus dwelling on the signification of hemoptysis. And the importance of such early detection will be still greater than at present, as soon as the advancement of

knowledge shall have given us well-founded hope of being able, by clearly determined means, to arrest or prevent the further progress of the disease.

I am aware that persons who have had attacks of hemoptysis, without subsequently experiencing any serious symptoms, are occasionally met with. But it must also be admitted that it is not excessively rare to observe individuals who have a cavity at the apex of one of the lungs, without being ill, without even having dry cough, unless from time to time; and that it is likewise very common to discover cretaceous concretions at the apex of the lungs in aged persons, where no suspicion of the fact has been entertained before the post-mortem examination. So that, unless extremely attentive and repeated examination of the upper part of the chest, by means of auscultation and percussion, have proved the absence of tuberculization in individuals who have had hemoptysis, without subsequent symptoms, for a series of years, these cases afford no satisfactory proof that hemoptysis may occur independently of pulmonary tubercles.

There is at this moment, in the Hospital Beaujon, a woman who was seized there, some months since, with an extremely severe attack of hemoptysis; and this woman, a few days before the attack, did not present evident local signs of tuberculous disease: nor did such signs exist for some days after the spitting of blood had ceased, although there had been cough for several months, attended with slight loss of flesh. But the signs in question soon began to develop themselves, although their establishment was still but slow; and at the present time, the hemoptysis, which might have been considered essential at the time of its occurrence, cannot be regarded otherwise than as a symptom of tubercles.

Besides, analogy is here, for once at least, in accordance with observation; for when hemorrhage occurs in an organ more or less deeply placed in the frame, it is almost invariably the signal of some radical alteration of its structure. I may add, that when hemoptysis occurred before the other symptoms of the tuberculous affection, it was sometimes followed by dyspnœa, came on quite suddenly, (Case LV, &c.) generally in the midst of perfect health, without precursory phenomena, or appreciable cause; and it is natural to suppose that its source, though con-

cealed, was nevertheless the same as that destined to give more or less frequent rise to the same symptom during the subsequent progress of the disease.

Sex had a marked influence on hemoptysis. The symptom was of more frequent occurrence in women than men, in the proportion of three to two: thus, of forty-two women, carefully questioned in regard of this point, thirty-six had spit blood; and of thirty-eight men twenty-one only had suffered from the same symptom.

The relation subsisting between hemoptysis and the *age* of the subjects in whom it occurred, was not the same in both sexes. The third part of the women, aged between nineteen and forty, had had no spitting of blood; whereas one seventh only of those aged between forty and sixty-five were free from it: this is the inverse ratio to that which ought to exist, were the opinion of certain practitioners—that hemoptysis may, in certain cases, be considered as supplementary of the catamenia, when either suppressed or diminished in abundance—founded on correct observation. In the male, on the contrary, the proportion was exactly the same on both sides of the fortieth year; of twelve subjects, aged upwards of forty, six had hemoptysis, and of twenty-six aged less than forty, fourteen. If this small number of cases be insufficient to establish with certainty the relation of age to the frequency of hemoptysis in both sexes, it may, at least, draw the attention of observers to the point, and lead them to the prosecution of useful inquiries in the same direction.

Age had no obvious influence on the amount of hemoptysis; and, as respects the frequency of its return, in the same person, this was proportional to the duration of the disease.

However, it is well worthy of remark that hemoptysis is extremely rare in tuberculous children under the age of fifteen. All observers, who have made the diseases of infancy a subject of study, are agreed upon this point; and M. Guesnard[1] assures us, that, of nearly one hundred phthisical children who fell under his observation, two only had hemoptysis,—both of them females, one aged nine, the other eleven years.

I have also endeavoured to ascertain whether there were or were not any connexion between hemoptysis, and strength or weakness of *constitution*. I found among forty-eight subjects,

[1] Thèse, p. 12.

who had had spitting of blood, an equal number of persons endowed with each of these varieties of constitution; there was, however, a predominance of strong constitutions among females.

In some instances, severe hemoptysis occurred only once in the course of phthisis; in rare cases, on the contrary, it recurred three, four, or a greater number of times. The following case exemplifies the latter variety.

Case X. A young man, aged 18, well made, of large stature, black hair, quick temper, and moderately fat, was admitted into the Hospital of La Charité on November 26th, 1821. Born of healthy parents, but subject to shortness of breath from infancy, he was seized, at the end of October, while in a state of perfect health, and without assignable cause, with abundant hemoptysis; since then he had continued to spit blood,—but in small quantity, until the last few days. Cough had set in with the hemoptysis; was attended with expectoration to a small amount, and on the whole gave little inconvenience: there were neither pains in the chest, heat, or rigors. He was very little more sensible to cold than usual: he had refused to undergo any kind of treatment, had made no change in his habitual diet or occupations, and decided with much reluctance to enter the hospital.

November 27th. *Present state.* Expression of face rather lively and contented; slight loss of strength; breathing but little more frequent than natural; cough infrequent, brought on by lying on the back; sputa somewhat viscid and yellowish, aerated, some of them very red; inconvenience felt from lying on the left side; chest somewhat less sonorous under the left than the right clavicle. The respiratory murmur was inaudible from time to time in some spots, and on the lateral surface of the left side, a noise, assimilable to that of a bubble of air circulating in a canal of moderate caliber, was heard with the help of the stethoscope; pulse calm, rather full; heat of skin natural; tongue natural, appetite good; no thirst; abdomen yielding and free from pain; slight diarrhœa for the last two days.

V.S. to eight ounces [250 *grammes*]; *barley-water sweetened with syrup of gum; gum potion; nearly a pint* [*half a litre*] *of milk; quarter of house-allowance of bread.*

No appreciable change on the following day. On the 29th,

shortly after the hour of the visit, abundant hemoptysis, to the amount of about six ounces and a half [200 grammes], took place; blood black or spumous, and of a beautiful red colour; respiration as before; results of auscultation same as on the 27th.

V.S. to eight ounces [250 *grammes*]; *blister to the left arm; barley-water; emulsion; three soups.*

30th. Return of the hemoptysis, accompanied with sensation of dragging at the pit of the stomach; and without any increase of cough, heat of chest, or previous rigors.

Up the 8th of December, he scarcely expectorated a few sputa slightly tinged with blood; but on the morning of that day, while in a state of the most perfect quietude, the hemoptysis returned with much greater violence than ever: respiration weaker posteriorly on the left than the right side.

V.S. to twelve ounces [350 *grammes*].

9th. Slight pain in the throat and difficulty in swallowing; thirst moderate; bowels regular; heat of body increased generally; pulse quicker than before; sputa white; face thin, and of dull white colour.

From the 9th to the 15th, three attacks of copious hemoptysis occurred; for these the patient was twice bled, and had a large blister between the shoulders. 16th. Sputa moderately thick, of yellowish colour, and somewhat nummulated.

During the next fifteen days the appearance of the sputa continued very closely the same; the respiration more oppressed: the cough more violent than usual; but little heat of skin; night perspirations; appetite increased, which led to a gradual increase of the food allowed, in such manner that on the 28th the patient had a pint and three quarters [1 litre] of milk, with a quarter of house-allowance of bread, sometimes even a little more.

January 2d. Considerable dyspnœa; cough more violent when the patient lies on the left than the right side; no rhonchus audible on the anterior surface of the chest; pulse sharp and rather frequent; the former gaiety of the patient has given place to ennui; he had kept his bed for several days, and was losing flesh exceedingly.

Two rice-creams.

From the 2d to the 8th. No manifest change, except in the character of the respiratory murmur, which became very strong, and, as it were, bronchial under the left clavicle.

9th. Tongue, hitherto, of natural colour, now of bright red hue. 10th. Difficulty of hearing, amounting almost to complete deafness. 11th. Deafness apparently increased; the patient was continually groaning; pulse rather full and tumultuous.

V.S. to eight ounces [250 *grammes*] *; barley-water.*

12th. Tongue dry and blackish; intense thirst; heat of skin rather pungent; pulse less full and tumultuous than on the previous day; gurgling under the left clavicle; sibilant rhonchus on the right side.

V.S. to eight ounces [250 *grammes*].

Blood rather thickly buffed; three stools on the 13th.

During the night of the 13th, almost constant delirium. 14th (in the morning). Face pale; look of depression; deafness as before; marked dry heat of skin; respiration noisy, accompanied with crepitant rhonchus on the left side; cough frequent; sputa small in quantity; tongue dry and furred.

Ptisan of violets; gum potion.

15th. Eye somewhat less dull than before; pulse as usual, rather full; rest as the previous day. Delirium in the night. 16th. Face mottled with red; intellectual faculties in good order; tongue dry; heat of surface considerable; cough somewhat less frequent; gurgling under the left clavicle; the patient frequently throws the bed-clothes off his chest.

The symptoms continued the same until the 18th, on which day he expired at 2 o'clock p.m.

Sectio Cadaveris; *forty-two hours after death.*

External appearances. Marasmus carried to the commencement of its third stage.

Head. Brain firm; non-vascular; two small spoonfuls of serosity in the lateral ventricles and in the lower occipital fossæ.

Larynx, not examined.

Chest. A few adhesions at the apex of the lungs. Right lung somewhat crepitating, slightly engorged here and there, presents throughout its entire substance a great number of semi-transparent, gray granulations, of the size of a millet-seed. On the left side, the upper lobe was completely converted into tuberculous cavities, containing a turbid, grayish, fetid matter, and separated from each other by septa of gray, semi-transparent matter, half a line [1 millimeter], or a little more, thick. The lower lobe was affected, but to a less advanced degree, in the

same manner; the septa between the cavities were here less thick, and the pulmonary tissue still permeable by the air in some places.—Heart of natural size; walls of left ventricle somewhat less thick than usual.—Aorta healthy.

Abdomen. Mucous membrane of the stomach pale over the entire surface, and covered with thick mucus; that of the small intestine perfectly healthy, with the exception of a few red oval patches in the neighbourhood of the cæcum.—Fæces thick.—Spleen larger and firmer than natural.—Liver and other abdominal viscera perfectly healthy.

There are several points of view under which this case is extremely remarkable. The hemoptysis is certainly the most striking phenomenon. Its repeated return, in spite of all treatment, might perhaps, by some, be ascribed to the rapid progress of the tuberculous disease; but such an explanation is inadmissible, inasmuch as its progress was much more rapid in other cases, (Case XXXVII,) without the very slightest hemoptysis having occurred,—and inasmuch as, taking all the cases I have observed together, the general fact is that the frequency of spitting of blood is directly as the duration of the disease. Venesection was had recourse to as often as the patient's strength permitted, and, as has been seen, without the least success. The hemoptysis frequently recurred on the day after bloodletting had been practised, just as if the patient, instead of having been bled, had committed some excess at table or otherwise.

In respect of the causes of this hemoptysis, it is to be observed that it came on quite suddenly, without any assignable reason, without precursory symptoms, or previous cough, in the midst of apparently perfect health;—further, that it could not be attributed to pulmonary catarrh, for none existed, and that it must necessarily be ascribed to the presence of tubercles, of which it constituted the earliest sign. This conclusion once admitted, it results further from it, that the development of the tubercles was independent of all inflammation of the bronchi, that they were the cause, and not the effect of the pulmonary catarrh. I shall hereafter recur to this important matter; but I may remark here, that the opinion I advocate in respect of the present case, derives confirmation from the results of percussion and auscultation. We have, in truth, seen that at the period of the patient's

admission the chest was less resonant under the left than the right clavicle; and this circumstance signified the existence, at that time, of disorder too considerable to be ascribed to inflammation of the bronchi,—an inflammation which, no matter what be the hypothesis adopted, was necessarily recent.

In some rare cases, hemoptysis was apparently produced by a paroxysm of cough. But it almost always came on without appreciable cause, was rarely attended with heat, or pain in the chest, or by increased febrile action.

As respects the intimate mode of production or mechanism of hemoptysis, inasmuch as it is not uncommon to observe this symptom at the very outset of the disease, or nearly so, at a period when the existence of pulmonary excavation could not be suspected, I am of opinion that it must, of necessity, be considered a result of exhalation. Exhalation, as has frequently been ascertained in cases of epistaxis, may cause considerable loss of blood in a very short time. The same mode of production commonly prevails, in all probability, even when cavities have formed; for it is extremely rare to find open vessels in their interior. In some cases, however, rupture of vessels, as has already been stated, is the true source of the hemorrhage.

SECTION IV.—DYSPNŒA.

Setting aside those cases in which pneumonia, pleurisy, or inflammation of the pericardium coexisted with the principal affection, there was, generally speaking, but little dyspnœa; the patients, indeed, were not inconvenienced by it, and, for the most part, were not aware of its existence, unless after exercise of some kind. It followed, in respect of progress, that of the pulmonary malady, and was rarely carried to excess. I have, indeed, known only three patients obliged to lie with their heads very high, or remain sitting up in bed, in order to render it less distressing. The post-mortem examination of these subjects disclosed nothing capable of accounting for the peculiarity: the heart was healthy, and its orifices natural; there was no effusion of serosity into the cavity of the pleuræ.

In a certain number of cases dyspnœa did not set in until

one or more months after the cough had commenced, but in the majority of instances appeared coevally with this. In some cases (in about one tenth part of the whole) it even preceded it, and under these circumstances dated from the occurrence of hemoptysis, which like itself had appeared before the other symptoms. Oppression of breathing and hemoptysis were then in all probability not the harbingers, but the first effects, of pulmonary tubercles. Perhaps the same was the case even where no hemoptysis had occurred; but this is far from being matter of certainty, for a great number of patients had had more or less difficulty of breathing from infancy, a period of life to which there was no motive for referring the development of the tuberculous disease. And among these subjects (who formed one ninth of the whole number) there were proportionally as many who had attained the age of fifty as among those in whom dyspnœa had set in at the same time as the first symptoms of phthisis.

The oppression of breathing was referred by the patients to the central part of the chest, no matter what amount of difference existed between the alterations in the two lungs. Three cases only furnished exceptions to the rule. In these the patients felt more uneasiness and a stronger sensation of obstruction on the side more affected than on that which was less so.

SECTION V.—PAIN.

Pain, as is well known, is not the symptom which distresses phthisical patients the most. Many were altogether free from such suffering, or only spoke on the subject when their attention was particularly drawn to it. The minority only complained spontaneously of pain; and there can be no doubt that this complete absence, or rarity and slight severity, of the pain suffered by phthisical patients, combined with the almost insensible progress of their symptoms, must concur very frequently in deceiving them as to their real situation. Nevertheless, without including the pleuritic symptoms which were the immediate cause of some patients seeking medical aid, the great majority had suffered from pain either between the shoulders, or in the sides of the chest. Pain of this latter kind had existed

in one third part of the cases, and was sometimes severe and of rather protracted duration. It occurred at various periods; in some cases two or three months before death, when cough and expectoration had already existed for a year, two years, or upwards; in others (when the disease ran its entire course within a period of from five to six months) shortly after the manifestation of the first symptoms. It continued in some cases a few days, in others one or more months, and was frequently violent enough to inconvenience the patients, and induce them to seek advice, without, nevertheless, forcing them to keep their beds.

In the majority of cases these pains were proportional in severity to the extent of the pleural adhesions (generally speaking of cellular character) present in each case, and pretty frequently to the number and size of the cavities. And as these two kinds of morbid change were almost always associated and proportional in amount to each other, it would be a matter of difficulty to form any determinate opinion upon the cause of the patient's sufferings, did we not know that tubercles form in other organs without exciting pain, and that the pains in question resemble those originating in the pleura, are increased like these by inspiration, by coughing, &c., and have a pricking, tearing character. They are, without doubt, like the adhesions themselves, the result of chronic inflammation. I have, besides, in a small number of cases, succeeded in convincing myself in a more positive and direct manner that such was in truth the source of the thoracic pains of phthisical subjects. I allude to those cases in which there were large cavities and scarcely any pleuritic adhesions on one side, and on the other general cellular adhesions without cavities; while the thoracic pains were limited to the latter.

However, as the cervical and axillary glands, when tuberculized, are occasionally the seat of pain (Case IX,) it is presumable that, under certain circumstances, pulmonary tubercles may be so also. Such was, in truth, the fact in the only case of encysted tubercles I possess notes of. (Case LIV.) The subject of this case (a woman) had suffered from pain between the shoulders during the last fortnight of her life, and there were no adhesions between the lungs and pleuræ. The same is true of certain cases of acute phthisis, in which there were more or

less sharp pains felt in places where no evidence of pleurisy was discoverable after death. (Cases XL, XLI.) It would appear then, that in some cases the pains in question may be the result, at once, of the development of tubercles, and of the adhesions to which they give rise.

Twenty-two patients declared that they had not felt pain in any part of the chest. In the majority of these subjects there were no adhesions, except at the summit of the lungs, whereas the cavities were of as large dimensions and as numerous as in cases where pains, more or less acute, had existed. This series of patients confirms what has just been said respecting the most common cause of thoracic pain in phthisis. It is, in truth, readily conceivable that pleurisy, limited to the upper part of the pleuræ, should not be productive of suffering; for the corresponding portion of the thorax is the least moveable, and pleuritic pain appears to owe all its sharpness to movement of the ribs and expansion of the pulmonary parenchyma.

Besides, if, as I have remarked in the first part of this work, inflammation of the pleura and the adhesions it gives rise to, depend, in many cases, on the action of tubercles, it is intelligible that the pains in question should manifest themselves at various periods, inasmuch as tubercles are, generally speaking, developed in successive crops.

To resume :—These pains were proportional in severity to the amount of pleuritic adhesion, and not to the size and number of cavities in the lungs; they appeared to result from the chronic inflammation of the pleuræ, which determines the formation of adhesions; and when the latter existed only at the apices of the lungs, no pain was experienced, even though excavations of large size were present.

In order to avoid mistaking the thoracic pains due to tuberculous development, for others of a different character, it is essential that the observer examine the walls of the thorax with care, and assure himself that intercostal neuralgia, as described of late by M. Bassereau and M. Valleix,[1] be not present. This species of neuralgia, as has been remarked by the latter writer, is not uncommon in phthisis.

The wandering character of the thoracic pains of phthisical

[1] Traité des Névralgies, ou affections douloureuses des Nerfs. Paris, 1841, p. 333.

patients is another point in their history which deserves mention; one day they are felt in a certain spot, the following in another. This fact is easily explained with the aid of morbid anatomy. Under these circumstances, the pains in question are regarded by the patients themselves, and sometimes even by medical men, as rheumatismal; and this, more especially when they are seated in the shoulders, no doubt because they are then increased in acuteness by movement of the arms.

It is further worthy of remark, that percussion of the walls of the chest is pretty frequently productive of pain, more especially of the side chiefly affected, and, generally speaking, at the summit of the chest.

SECTION VI.—FEVER.

The majority of patients have fever at the time of admission into hospital. I have endeavoured to ascertain its period of origin with precision; and have considered myself justified in believing I had succeeded, whenever I could satisfactorily determine the time at which rigors or alternations of cold and heat had set in,—more especially when these were accompanied, at the outset, with thirst or palpitation of the heart. Guided in this way, I came to the conclusion that fever had declared itself along with the earliest symptoms of phthisis, and attended its progress throughout, in somewhat more than one fifth of my patients, or in twenty-one of ninety-five patients whose history was satisfactorily ascertained in respect of the point before us. Five of these individuals were affected with acute phthisis. (Case XXXVII, &c.) In the others the duration of the disease had varied between five months and three years, and among these were some cases of simple phthisis,—among the rest, two very remarkable ones, which will be made the subject of further consideration, when we are engaged with the latent variety of the disease. (Cases L, LII.) In nineteen other cases fever was established during the first half of the course of the disease, at a period more or less distant from its actual outset; here the malady, more or less complicated, had run a course of from three months to five years. In the remaining cases, that is about three fifths of the whole, fever did not appear until the

second period of the disease, sometimes only a short while before the fatal issue; in all of these instances morbid changes of other organs were associated with the pulmonary disorder.

Inasmuch as fever frequently commenced during the first half of the course of the disease, and even coevally with the appearance of the earliest symptoms—in other words, when the lungs were the sole organs implicated—it follows that its principal and often sole cause was the morbid change existing in the lungs.

Unless in cases of very acute or very chronic phthisis it was a matter of impossibility to determine what circumstances thus retarded or hastened the establishment of fever. And, in truth, I am of opinion that to set about the investigation of this point, as of that of the varieties observable in a multitude of other symptoms, would be no less unsuccessful than a search after the causes of diversities of tastes, of features, and of stoutness of individuals enjoying perfect health. We must learn to content ourselves with a knowledge of principal facts, without striving to comprehend the reasons of all the varieties they present.

Although *rigors* were one of the most common febrile symptoms, they were not of constant occurrence, and were, in fact, wanting in one sixth part of the cases, or in sixteen out of ninety-five. The patients, in these exceptional cases, complained only of great sensitiveness to the influence of cold, declared they had never had rigors before admission into the hospital, and remained free from them during their sojourn there. This is not more singular, however, than the absence of the same symptoms in cases of phlegmonous abscess; a circumstance of not very unfrequent occurrence.

In the majority of cases, the rigors recurred every evening, rarely at any other time. They generally occurred but once in the day; but, in some subjects, several times at irregular intervals. I have not, in any case, noticed the two attacks of the kind which, according to certain authors, come on almost daily at a fixed hour.

The rigors which recurred daily at the same hour, were a source of sufficient inconvenience, in some instances, to require the employment of means for their suppression. These means were either completely or only partially successful. But the heat of skin always remained above the natural standard; and after the rigors

had been diminished in violence, or altogether suppressed for a certain time, they reappeared just as before the administration of the febrifuge. The exhibition of sulphate of quinine in cases of phthisis, requires caution, as is easily understood, on account of the frequency of an inflammatory state of the stomach.

These attacks of shivering were usually followed by heat and *perspiration.* I say usually, for perspiration was absent in several cases,—in the tenth part of the patients who had rigors. They also sometimes occurred without the latter, and then almost invariably by night, during sleep. Such was their abundance, and the inconvenience they caused, that some subjects dreaded to resign themselves to sleep. They were influenced by the state of the other organs, and generally coexisted with diarrhœa; the latter discharge was occasionally very abundant, while they were at the same time so extremely copious, as to oblige the patients to change their linen once or oftener during the night. In vain did I designedly reiterate my questions, with the view of ascertaining whether these symptoms might not be supplementary of each other; I have never succeeded in convincing myself of the reality of the balance of the functions taught by writers. I have, no doubt, known diarrhœa become less violent for two or three days, during the subsistence of more or less copious perspirations, but it then recurred in as great abundance as before; so that the diminution of the one, arising with the establishment of the other discharge, was a mere coincidence.

It will be perhaps urged, that if the balance of the functions in question does not really exist in phthisis, it yet does so in other diseases. But I have been equally unsuccessful in my search after it in cases of typhoid fever, of rheumatism, and in fact, generally speaking, of every affection where either of the two symptoms supervened upon the other. I could not convince myself that they had a reciprocal influence, or were mutually dependent; and I believe I may affirm, that if the alleged relationship does exist sometimes, it does so only exceptionally and accidentally. This fact is perhaps not without its importance, inasmuch as the majority of practitioners regard this balance of the functions as an established position, by which they are guided in practice.

The sudamina, so frequently observed after perspiration in the course of typhoid fever, are much less frequent, *cæteris*

paribus, in every other disease. I have occasionally seen them in phthisis, but never in such abundance as in typhoid fever, in which affection the elevation of the epidermis, which constitutes this kind of eruption, affects the surface so extensively, that the epidermis itself may be removed by slight friction from almost the entire surface of the body.

It is to be remarked that these copious perspirations indicate disturbance of the functions of the skin, as remarkable in amount as in duration; and that this derangement, whether due to sympathy or some other cause, is no less real, and takes place without discernible alteration of the structure of the affected organ. Hence it follows, that a function may be more or less seriously disordered for a length of time, without the establishment of appreciable change in the texture of the organ performing it. And it may be further observed here, under the existing deficiency of facts demonstrating in a direct manner the possible occurrence of diarrhœa independently of appreciable alteration of texture of the mucous membrane of the intestine, that such is the actual truth is presumable from the analogy existing between copious sweats and diarrhœa more or less abundant. I do not say this is positively the case; because I hold that the only true purpose of analogical argument is to lead to further inquiry, to guide in the search after new facts, and, under no possible circumstances, to supply the place or assume the importance of them. To give it this character, would be to conclude from possibility to actual existence, which is absurd.

To conclude this subject, I may observe, in especial reference to those pathologists who will admit no other cause of disturbance of function but inflammation, that it would be a matter of difficulty—no matter what anxiety we may feel on the point—to persuade ourselves that inflammation can have anything to do with the production of perspiration in phthisical subjects, whose skin remains pale and flaccid amid these enormous evacuations.

SECTION VII.—THIRST.

Like their other symptoms, the thirst of phthisical patients was subject to great variety,—was altogether absent in a fourth part of the cases, and existed to a greater or less amount in the

remainder. There was no uniform connexion between this symptom and the state of the stomach, of the intestinal canal, nor of the diarrhœa. It was much more commonly proportional in amount to the existing fever, almost invariably set in at the same time as this, followed its progress, increased during its evening and nocturnal exacerbations, and did not set in until after it in a small number of cases.[1]

Next to the symptoms which we have now considered, those of most frequent occurrence were connected with morbid changes of the digestive organs; and for this reason it appears to me natural to undertake their examination now, before we pass to those dependent upon morbid changes in the air-passages.

SECTION VIII.—GASTRIC SYMPTOMS.

At different periods of the disease, my patients suffered from gastric symptoms; and as these symptoms varied in character with the textural changes of the mucous membrane of the stomach, I shall describe separately those dependent upon each kind of anatomical change.

§ 1. *Gastric Symptoms in subjects having the mucous membrane of the stomach softened and attenuated.*

At a variable period, rarely at the outset of phthisis, more usually two, four, five, six, or a greater number of months before death, patients affected with this modification of morbid change lost their appetite, and subsequently suffered from more or less violent pain at the epigastrium. Some days or months later,

[1] In the majority of cases, unattended with thirst, the mucous membrane of the stomach was in the natural state, and diarrhœa had not occurred till the close of the disease, sometimes thirty, forty, or fifty days before death. In two cases only it had existed, with few interruptions, from nine months to two years. In somewhat more than one half the patients, annoyed by more or less urgent thirst, the mucous membrane of the stomach was perfectly healthy, or exhibited none but recent anatomical changes; and almost all of them had laboured under diarrhœa,—preceded (in two fifths of them) sometimes for twenty months and upwards by thirst. In the other individuals thirst either set in with or followed it, even when the diarrhœa had been considerable. (Case IV.) It was extremely distressing in two subjects, in whom the gastro-intestinal mucous membrane was healthy, and who had been free from diarrhœa.

nausea and, next, vomiting supervened; or, on the contrary, these two latter symptoms led the way, and the pain referred to did not manifest itself till one or more weeks had elapsed. These various symptoms rarely came on simultaneously. In several cases they existed to a very intense degree from the first; in others their establishment was slower: generally speaking, they became daily more and more intolerable, and persisted continuously, with remissions of variable duration, to the close of life.

These symptoms were observed in almost all the patients, in various degrees. Sixteen out of nineteen had nausea and pain, more or less acute, at the epigastrium; and fifteen vomited. Three had no notable gastric symptom, in spite of the advanced stage and extent of the anatomical change, discovered in the mucous membrane. In some individuals the occurrence of pain, nausea, and vomiting had been preceded, for one, two, or three years, by more or less marked disturbance of digestion.

The pain was pungent, lancinating, and sometimes attended with a sensation of heat; in some cases it produced the feeling of a bar being laid across the epigastrium; in others its characters were indefinable. Generally continuous, it increased in severity, as a general rule, until death; in some instances intermitted, or even disappeared during the closing days of life. When extremely violent it absorbed the attention of the patients; so much so that they disliked answering questions unconnected with it: under these circumstances, had it not been for my constant habit of inquiring closely into the state of all the functions, the phthisical affection would more than once have escaped me. The violence of this pain was the more remarkable from its being observed in cases, where the patients were reduced to a state of extreme feebleness, and where numerous complications were present. The least pressure at the pit of the stomach was insupportable; and fluids, when swallowed of a medium temperature, often appeared iced. Can we believe, after the evidence of such facts, that the mucous membrane is so insensible, as has been alleged, or that it really testifies its sufferings in a different manner from other organs?

This pain was not materially relieved by opium; Seltzer water lessened it occasionally for one or more days. In one instance (Case LIV) it was temporarily allayed, shortly after its first appearance, by a few cordial drops.

The matters vomited were almost always bilious. Generally occurring but seldom at the outset, vomiting took place more frequently towards the close of the disease.

In the midst of these disturbances, some patients digested light food, without particular difficulty; others could take nourishment at a certain hour only of the day, generally the morning. (Case LV.) Sometimes the appetite improved for a certain time, in spite of the mucous membrane being seriously altered in structure, over a variable extent of surface (Case XXX.) But at a certain period, and in the majority of cases, the susceptibility of the stomach became such, that not even pure water could be borne; and, under these circumstances, the patients resisted the calls of thirst, from the dread of vomiting.

Anorexia, nausea, vomiting, and epigastric pain were, consequently, the most unfailing symptoms in cases where the mucous membrane of the stomach was softened and attenuated: they show that this organ, like others, reveals the occurrence of textural change by pain, and disturbance of functions.

Many of the cases recorded in the course of this work give evidence of what has now been said: the following one appears to me of sufficient interest to deserve a place here.

CASE XI. A woman, aged 33, the mother of several children, not of strong constitution, and not subject to cold, was admitted into the Hospital of La Charité, the 13th of July, 1824. She had been confined ten months before, had suffered much pain in the left knee for the last six months, and presented all the rational symptoms of a white-swelling of that joint; she had been under treatment for this, in a surgical ward, where, after the application of two moxas, the pain disappeared, the size of the joint diminished, and ankylosis took place. The patient was removed to M. Chomel's wards, on the 5th of November, and she then added, to the preceding details, that she had had, on the 1st of August, after great mental disturbance, rigors, and paroxysms of heat, cough, epigastric pain, nausea, and occasional vomiting. At the same time her thirst increased, and she lost her appetite: these symptoms, which had continued from their first establishment, were subsequently increased in number by great heat in the evenings, night perspirations, and occasional rigors. Expectoration did not commence until the

month of October. Shortly after, very sharp pain supervened in the right side of the chest, and disappeared, after a duration of one week, almost immediately after the application of a blister to the affected spot. For the last three days the stools had been frequent and watery; loss of flesh commenced at the period of the patient's confinement.

November 5th. Expression of face rather lively; loss of strength considerable, the patient can scarcely walk round her bed; thirst moderate; anorexia almost complete; tongue natural: epigastrium painful, tenderness there under the slightest pressure; frequent nausea, sometimes followed by vomiting of a few gulps of bile, more especially by night, and after coughing; abdomen, generally, somewhat painful; stools watery, preceded by colic-pains; cough frequent in the night, much less troublesome by day. Sputa white and frothy, floating on a great quantity of clear fluid. Respiration rather hurried; chest somewhat less sonorous on the right ride, laterally and posteriorly, in its lower half, than on the opposite side; respiratory murmur stronger and harsher under the right than the left clavicle, accompanied, also, by a few clicks of crackling rhonchus; pulse 115, small and weak; heat not great by day, considerable by night, night-sweats and rigors in the evening. The patient referred her oppression to the epigastrium, and suffered from much uneasiness and distress.

Solution of gum-syrup; rice-ptisan sweetened, and acidulated with lemon-juice; gum potion, with three quarters of a grain [5 *centigrammes*] *of opium.*

The gastric symptoms continued, and became daily more severe. From the 8th to the 21st of November, (forty-eight hours before death,) vomiting of bile occurred frequently every day, either after coughing, or independently of this; the previous uneasiness and anxiety had reached their maximum; sense of suffocation; very sharp pain at the epigastrium, the slightest pressure there unbearable; distaste for every kind of food; the lightest broth caused a sensation of extreme weight at the pit of the stomach: eventually she vomited everything she swallowed, drank very little at a time, and her drink, though of medium temperature, appeared as cold as ice.—The tongue was either natural, or simply a little pale, until the 18th; it then became red, hot the seat of prodding pain, and covered with white

pultaceous patches, renewed several times. This exudation, which existed on the lips, also, the inner surface of the cheeks, and the velum palati, commenced in the form of minute particles, as large as those of coarsely-ground rice, which enlarged, encroached upon each other, and soon covered the entire surface on which they were observed.

The stools were watery, but few in number until the 18th; they then suddenly became very numerous, and during the final three days they were involuntary, and almost continually passing. At the same time there was general abdominal pain, more especially in the right iliac fossa.

The cough made no obvious progress; the sputa continued small in quantity, and of light weight; the results of percussion remained the same as the first day. On the 19th, the respiration was tracheal under the right clavicle, without pectoriloquy.

The pulse was constantly small, weak, and very quick, unless for the last four days, when it fell from one hundred and forty to one hundred pulsations in the minute. The patient was extremely sensitive to cold.

She was restless to a degree, constantly changing her posture, and had sometimes much difficulty in pointing out the seat of her suffering, such was the general distress under which she laboured. Her countenance was expressive of uneasiness, and disgust for everything. She expired the 23d of November, at six o'clock, a.m., without having been delirious.

Sectio Cadaveris; *twenty-six hours after death.*

External appearances. Last stage of marasmus; nothing else remarkable.

Head. Slight sub-arachnoid infiltration; brain perfectly healthy; two small spoonfuls of serosity in the right lateral ventricle somewhat less in the left. The rest in the natural state.

Neck. Epiglottis, larynx, and trachea present nothing worthy of note.

Chest. Left lung, free from adhesions, contained in the middle of its upper lobe a grayish whitish mass, of the size of a small hen's egg, composed of a multitude of tuberculous granulations, separated in several places from each other by reddish slightly granular tissue. Elsewhere there were gray granulations, some of which, placed immediately underneath the pleuræ, protruded outwards. The entire surface of the

right lung adhered to the parietes of the chest by means of a double pseudo-membrane, the laminæ of which were closely united to each other. This membrane was much thicker inferiorly than superiorly, and in great part tuberculous. There was a considerable number of yellowish and grayish granulations under the pulmonary pleura, more especially under that of the interlobular fissures,—the edges of these fissures were converted to a depth of one line [2 millimeters] into gray semi-transparent substance. At the apex of the upper lobe was a cavity of the size of a small apple, containing a moderate quantity of pus, communicating with the bronchi, and unprovided with distinct pseudo-membrane. The pulmonary tissue was somewhat firmer immediately around it than elsewhere.—The bronchi on this side were of a deep red colour close to the cavity, but not in any other part of the lung.—Heart small, firm, and healthy; aorta natural.

Abdomen. Stomach, of moderate size, contained a small quantity of turbid bile. Upper half of mucous membrane mottled yellow, and as soft as mucus (except in a few spots) to within three inches and seven lines [9 centimeters] of the pylorus; it was removable with the back of a scalpel, like so much viscid mucus. The softened part was much thinner than natural. Near the cardiac orifice and along the lesser curvature, where the softening and attenuation were least marked, the mucous membrane exhibited four reddish eminences in the form of mammillæ, firmer than itself, one line [2 millimeters] thick, and a little less broad. There was nothing peculiar in the state of the vessels underneath the attenuated part of the mucous membrane.—Mucous membrane of the small intestine of very delicate pink colour, of proper thickness and firmness, small ulcerations in some of the patches of Peyer nearest the cæcum. The large intestine contained a little thinnish turbid liquid, tinged of a reddish colour. Entire length of mucous membrane coloured violet-red, finely mammillated, somewhat thickened, and as soft as mucus. In the ascending and transverse colon three ulcerations, measuring one line and a half [3 millimeters] in diameter, having the muscular coat for their fundus. There were others of still smaller size in the middle part of the rectum, grouped together, and not extending deeper than the mucous membrane itself. The sub-mucous tissue was

opaque, and more than treble the natural thickness throughout its entire extent.—Liver rather large, pale, fatty, and protruding beyond the edges of the ribs; the gall-bladder contained bile of moderate thickness, and of the colour of plum-juice.—Spleen of ordinary dimensions, partially invested with pseudo-membrane, which contains a great deal of tuberculous matter in its substance. The spleen itself contains about sixty tuberculous granulations, of the size of a small pea, the adjacent tissue being healthy.—The meso-cæcum and gastro-hepatic omentum exhibit some small tuberculous patches on their surfaces.—Other viscera natural.

This case is interesting in a variety of ways. Such was the predominance of the gastric symptoms that, as I have already said, the tuberculous disease of the lungs might readily have escaped detection. The patient thought only of her stomach, and asked for relief only for the pain she suffered in that organ; it was almost necessary to use some harshness to obtain any answer respecting the state of her chest. The progress of the gastric affection was not very rapid, and yet I have never seen so much uneasiness and distress, nor known the countenance so strongly expressive of pain. But the point which is especially deserving of attention in this case is the gradual course of the symptoms,—their slight severity at first when the alteration of the mucous membrane was as yet, in all probability, inconsiderable, and their uninterrupted progress subsequently. At first the epigastric pain was slight; nausea and vomiting only brought on by fits of coughing; next the nausea grew continuous, vomiting occurred independently of coughing, became bilious, and from day to day more copious, and of more frequent occurrence; the pain, too, increased with time, and, in a word, the violence of the symptoms appears to have invariably been proportional to the amount of anatomical change.

However, it is right I should observe here, that the very legitimate doubts admissible respecting the cause of softening with attenuation of the mucous membrane of the stomach, lead also to uncertainty as to the morbid change to which the gastric symptoms in question are really referrible. It is also to be remarked, however, that in such cases as that now before us, softening with attenuation, or destruction of the mucous membrane of the stomach, is always, or nearly always, associated with

some other alteration of texture of that membrane; and hence, the symptoms it has been the habit to refer to an anatomical state of which the true nature is doubtful, might, in truth, be ascribable to another. For these reasons we should not be too positive in our opinions, and rather wait for the enlightenment of further experience.

The sudden onset of violent diarrhœa, during the closing days of existence, is another circumstance worthy of note in this case. It was accompanied with acute and general abdominal pain, and, without doubt, announced the invasion of one of those attacks of severe enteritis, which frequently arise towards the close of phthisis, and entail softening of the mucous membrane of the large intestine with great rapidity. Coupled with this softening, appeared considerable thickening of the sub-mucous cellular tissue, which retained its natural whiteness, although its excess of thickness must be regarded as the result of acute congestion.

The right lung and pleura are also worthy of note; the lung, by reason of the cavity it contained, exhibiting the rare condition of walls formed of pulmonary tissue, either actually healthy or merely somewhat indurated, the pleura, by reason of its tuberculized pseudo-membrane, a state of pleural pseudo-membrane which, as already mentioned, I have not witnessed except when tubercles existed in the lungs.

The pleuritic attack, which gave rise to the membraniform exudation just referred to, did not occur till a month before death; that is, at a period when tubercles had already formed at the apex of the lungs, especially of the right. The development of the tubercles could not, therefore, by any means be ascribed to the pleuritic inflammation. Nor have we a fairer motive for regarding this as the cause of the tubercles, seated immediately under the pleuræ, for similar tubercles, similarly placed, were found on the left side, where the lung was non-adherent and the pleura natural.

Lastly, the tuberculous matter developed in other parts besides the lungs, in the pseudo-membranes investing the right pleura and spleen, in the tissue of the latter organ and on the surface of the peritoneum, was, in all of these situations, in the same stage of development—in the crude state. This appears, as already stated, to testify to the agency of one and the same cause acting simultaneously on a number of organs.

§ 2. *Gastric Symptoms in patients in whom inflammation of the mucous membrane of the stomach was limited to its anterior surface.*

The eight patients, in whom I observed this anatomical state, had suffered for a greater or less length of time from loss of appetite, pain and heat at the pit of the stomach, and occasional nausea; a few among them from vomiting. One only had been free from pain; here the pulmonary disease had lasted five years, and the appetite did not fail completely till the last days of life.

These symptoms, indicative of a morbid change of the mucous membrane of the stomach, did not manifest themselves all at the same time. In the majority of cases, loss of appetite led the way, and was followed, after a certain time, by pain at the epigastrium,—pain greatly increased by pressure, sometimes associated with burning local heat, marked by remissions, more or less complete, and of variable duration; the least food caused a sensation of suffocation. Lastly, nausea supervened, recurred more or less frequently, and was sometimes brought on by fits of coughing. Vomiting occurred in two cases; in one of these the matters ejected were bilious, in the other white and limpid. In all these cases, there was a hardness felt in the epigastrium,—the liver had descended below the ribs; and this mode of displacement led me more than once to suspect that these gastric symptoms arose from inflammation of the mucous membrane of the anterior surface of the stomach.

The duration of the symptoms was less than in cases of attenuation and softening; it varied between one and three months. The course of the disease was chronic; and nevertheless the pain and other morbid phenomena were occasionally strongly marked. Among the cases of this kind, which have fallen under my observation, the following is the most worthy of attention.

Case XII. A young woman, aged 26, of tolerably strong constitution, of highly-developed nervous sensibility, having had "*a cold*" for five years, was admitted into the Hospital of La Charité, on the 20th of January, 1823. For the first thirty months the symptoms of her disease had been little

troublesome; after that time the cough and expectoration increased in frequency and quantity; spitting of blood set in, and continued uninterruptedly for five months, in spite of repeated venesection and application of leeches. During the two next years the patient's state appeared to improve; she recovered her flesh and strength almost completely; the catamenia, which had been suppressed for eighteen months, returned at their accustomed periods; slight cough and dyspnœa were the only symptoms remaining. Such was her state when, in the month of November, 1822, she was seized in the night, after dancing to excess, with rigors, followed by heat and perspiration, accompanied with pain in the right side, and an increase of the habitual cough and oppression of breathing. Thenceforwards the rigors recurred daily, towards the evening, the pain remained stationary, and, on the sixth day after this sort of relapse, hemoptysis came on and continued, though in gradually diminishing quantity, until the patient's admission.

January 9th. *Present state.* Headache, with sensation of weight in the head; considerable weakness; oppression of breathing; pricking pains between the shoulders; cough frequent by night; a few greenish sputa, speckled with blood, along with others more numerous, of light colour, and containing a great deal of air; mucous rhonchus on the right side, posteriorly; respiration distinct elsewhere; no resonance of the voice, nor pectoriloquy; tongue natural; thirst urgent; anorexia; nausea, from fits of coughing; epigastrium tender under pressure; bowels confined.

Pectoral ptisan; pectoral potion; two half rice-creams.

22d. Sputa nummulated, associated with clear-coloured mucus, free from blood; the patient complained of sharp pains in the right side. Leeches were applied to the seat of suffering, with marked benefit following on the same day.

23d. Pain at the epigastrium; nausea, independently of cough. From this time until the 17th of May, the day of her death, the following were the phenomena observed.

On the 27th of January a fresh pain came on in the right shoulder, around which crepitant rhonchus, mixed with gurgling, was detected. On the 29th, this pain had increased, the breathing was much more laborious than usual, the cough frequent, the sputa clear, and spotted with blood of bright red colour;

fine crepitation was audible over the entire posterior surface of the right side; the pulse very frequent, small, and feeble. Venesection to the amount of eight ounces [250 grammes] promptly removed these symptoms. On the 5th of February another attack of pain; slight crepitation under the right breast; immediate relief from the application of leeches. Subsequently the same symptoms, pain, dyspnœa, and crepitation, sometimes accompanied with yellowish and slightly viscid sputa, recurred, with more or less violence, from time to time, and were combated by the same means, regulated with due attention to the patient's strength. On the 5th of May there was manifest pectoriloquy between the shoulders and the spine; the sound dull under the right clavicle, where some small crepitation was audible. On the 11th, slight hemoptysis took place; the sputa were of dirty gray colour, and retained the same aspect to the last.

The loss of appetite and nausea continued for some days; the appetite then returned, the patient eating, during the month of February, a quarter of the house-allowance, without suffering any other inconvenience than slight oppression of breathing after meals. At the beginning of March the appetite again failed, and sharp pain at the epigastrium came on. On the 15th and 16th, she felt almost constant nausea, and occasionally slight bilious vomiting, with sensation of heat at the epigastrium. The anorexia continued, but the nausea diminished somewhat the following days; headache, sensation of weariness in the limbs, and occasional vomiting of bile were noticed. The same symptoms continued to a greater or less amount throughout the month of April; the epigastric pain was very acute, and vomiting of bile recurred from time to time. On the 2d of May the habitual uneasiness had increased; the patient was in a state of constant anxiety, the whole abdomen had become tender under pressure; the epigastric pain ceased not a moment, and was increased by coughing, or the slightest pressure, or even movement the body.

The tongue, hitherto of natural colour, now became very red, and covered with small, whitish, membraniform patches, easily separable from the subjacent surface; they disappeared to return a second time; and the epigastric pain, after having slightly diminished in severity, became exceedingly violent a few days before death.

There was no diarrhœa, except during the two closing weeks of life.—The pulse was invariably frequent; the temperature of the skin high in the evening; night perspirations frequent; rigors much less so.

Sectio Cadaveris; *twenty-six hours after death.*

External appearances. Last stage of marasmus; nothing else worthy of note.

Head. Adhesions between the arachnoid and dura mater, near the longitudinal fissure, and in some other places close by, effected by numerous white opaque granulations, (glands of Pacchioni,) originating in the arachnoid, which was more or less thick and opaque in the corresponding places; rather considerable sub-arachnoid infiltration; encephalon generally rather soft; three tablespoonfuls of serosity in the left lateral ventricle; somewhat less in the right; half a tablespoonful in the fifth ventricle; the walls of which were firm and resisting.

Neck. Cervical glands, on the left side, enlarged and tuberculous, but not softened. Bronchial glands in the same state. Larynx and epiglottis natural. Trachea of a pale pink colour, but free from the smallest ulceration.

Chest. Some slight cellular adhesions at the apex of both lungs: on the surface of both are several whitish and slightly reddish elevations, formed of tuberculous matter. The upper lobe, on the *right* side, presented two cavities, communicating with the bronchi, and a certain number of tubercles placed in the midst of a firm granular hepatized tissue, totally free from air, red anteriorly, and yellowish-gray coloured posteriorly. There were only a few tuberculous granulations in the lower lobe.—The upper lobe of the *left* lung contained some small tuberculous cavities, and gray granulations in a state of imperfect opacity, seated in the midst of gray, semi-transparent matter, into which this lobe was almost completely transformed. The lower lobe contained only a few granulations, and was slightly engorged at the base.—There were nearly four ounces [120 grammes] of serosity in the pericardium. The heart was small, but healthy; the aorta and pulmonary artery natural.

Abdomen. The liver extended about four inches and eight lines [12 centimeters] below the false ribs, was of considerable size, of tawny colour, dotted with red points, of moderate consistence, and fatty. The gall-bladder contained black, stringy,

very thick bile. The stomach descended lower than the crista of the ileum, was of large size, very much elongated, and partially overlapped by the liver; the mucous membrane covered with thick viscid mucus, in much greater abundance on its anterior surface than elsewhere: in the former situation of bright red colour, manifestly thickened, and somewhat softened, it elsewhere exhibited only a slight pink tint, and was of proper thickness and consistence.—Duodenum healthy.—Mucous membrane of the small intestine somewhat grayish in colour, and easily torn, exhibited vascular arborizations from place to place, and seven blackish ulcerations, 2 lines [4 millimeters] in diameter, placed at great distances from each other. Mucous membrane of the large intestine of grayish colour, in some places blackish, somewhat softened throughout; there were twelve small ulcerations in the cæcum and ascending colon, and three in the rectum immediately above the sphincter ani. The mucous tunic was detached to a short distance round them, and the submucous tunic, forming their fundus, grayish, and slightly thickened.—Mesenteric glands healthy; several of the lymphatic glands surrounding the biliary vessels tuberculized.—Spleen rather large, containing, in the midst of its substance, otherwise healthy, four unsoftened tubercles, of the size of a hazel-nut.

Let us proceed to examine briefly the chief circumstances in this case. The stomach was of very large size, situated very low in the abdomen, and partly overlapped by the liver; the mucous membrane of its anterior surface of bright red colour, thickened and somewhat softened,—in a word, inflamed. This inflammation was limited very closely to the space overlapped by the liver, a fact which seems to give strong evidence of the influence of that organ on its development. The gastric symptoms—anorexia, epigastric pain, nausea, bilious vomitings—stood in natural relation to the change of structure which existed; their severity might even have led us to fear the presence of some still more extensive alteration of the stomach; they followed a chronic course, daily acquiring new intensity. Thus, although the gastritis in this case wore the chronic form, it gave rise to obvious symptoms; such was the fact, too, in seven eighths of the cases, with this sole difference, that the symptoms were less severe, and, in the majority of instances, no vomiting occurred.

This additional series of cases corroborates a statement made in the preceding section, namely, that morbid changes are revealed in the case of the stomach, as of other organs, by pain, and disturbance of function.

We shall, by and by, pass to the special consideration of the state of the tongue; but I may take the present opportunity of observing, that in this, as in the preceding case, it retained its natural colour, remaining pale until the time it became covered with pultaceous patches, in other words, till long after the invasion of the inflammation of the stomach.

The development of tuberculous matter in the lymphatic glands is worthy of attention. The mucous membrane of the trachea was of a very slightly-marked red colour, less deep, indeed, than in the majority of subjects cut off by all kinds of diseases indiscriminately, and was neither thickened nor softened; it might be considered perfectly healthy, and hence it was utterly impossible to attribute the transformation of the cervical glands into tuberculous matter to any morbid influence on its part. It will, however, perhaps be maintained that the tuberculization of the glands surrounding the biliary ducts may be explained by the inflammatory state of the mucous membrane of the stomach. But to this notion it may be objected, that the lymphatic vessels of the organ which pass through the glands in question, do so after having first traversed those of the lesser curvature; and that as the inflammation of the mucous membrane did not cause the transformation of the latter into tuberculous matter, it does not appear very clearly how it could have that effect upon glands more remotely placed. I may further remark, that I have three times observed the glands surrounding the biliary ducts in a state of tuberculization, and that in none of these did I find the same morbid change in the glands of the greater or lesser curvatures, although I have in numerous instances met with inflammation, more or less chronic, of the mucous membrane of those parts.

I shall simply remark, with reference to the anatomical state of the lungs, that the frequent returns of inflammation in the organ of the right side lend support to what I have already said respecting the comparative unimportance of pneumonia, generally speaking, in phthisical subjects; and that, in respect of it, tubercles may be regarded as foreign bodies, the action of

which is almost invariably less detrimental than that of internal causes.

§ 3. *Gastric Symptoms in subjects in whom the fundus of the stomach was red and softened.*

Whether this morbid change existed in its simple state, or was associated with small ulcerations, or a mammillated state of the mucous membrane of the stomach, it was rarely attended with any particular gastric symptom. The appetite had, in such cases, failed long before death; but with few exceptions, and just as in cases where the stomach was perfectly healthy, total anorexia did not establish itself, in the majority of patients, till ten or twenty days before death. Epigastric pain, and nausea, were noticed in only the ninth part of the cases—or in two patients—and here only towards the close. This common deficiency of symptoms, in cases where a very serious textural change, displaying the characters of acute gastritis, was found after death, leads necessarily to the impression that that change was, in the greater number of cases, not developed till the closing days of existence.

Of the two cases just alluded to, the following is that in which the gastric symptoms lasted longest, and acquired greatest intensity.

Case XIII. An unmarried woman, aged 48, tall, of strong constitution, having ceased to menstruate for the last ten years, was admitted into the Hospital of La Charité on the 22d of September, 1822. She considered herself ill for nine months, was not subject to cold, and had never had pneumonia. The outset of her illness was marked by cough, expectoration, dyspnœa, and night-perspirations, symptoms which continued, with gradually increasing severity,—the perspirations, in particular, had become very copious. In the fifth month of the affection, hemoptysis of some severity came on, lasting for two days, with pain in the right side, which had continued since, but with less acuteness shortly after than at the time of its first occurrence; the patient could only lie on the left side. Rigors occurred but seldom; the appetite had failed from the appearance of the cough, and for the last four months, the patient had

only eaten pap and bread. She had suffered much from thirst, and lost flesh from the outset.

September 3d. *Present state.* Headache in every part of the head; giddiness for the last six months, whenever the erect posture is assumed; nose and lips of violet tint; she lies with the head high; respirations rather deep and frequent; cough moderately frequent; sputa small in quantity, clear and spumous, or greenish and streaked with white. On the right side anteriorly, and more especially outside the breast, the chest emitted a dull sound on percussion; pain, and either gurgling or very large crepitant rhonchus, audible almost all over the chest; under the clavicle, the respiration was tracheal, with imperfect pectoriloquy. On the left side nothing remarkable was discovered by auscultation and percussion. The pulse was frequent, irregular in force and rhythm, occasionally intermittent; the pulsation of the heart audible all over the chest, and accompanied with tolerably strong impulse at the precordial region, more especially opposite the sternum. The mouth felt clammy and bitter, the thirst urgent, the appetite completely gone, the tongue slightly red in the centre, the epigastrium painful for the last few hours; nausea of tolerably frequent occurrence, either after or during the intervals between the fits of coughing; bowels confined; abdomen slightly tympanitic.

Ptisan with nitrate of potass; gum potion with thirty drops of tincture of digitalis; twelve leeches to the anus.

The symptoms continued the same from the present time to the 1st of October, the day of the patient's death. The anorexia, nausea, and epigastric pain were more or less marked; no vomiting was noticed; the patient succeeded in eating a little soup without apparent increase of the habitual uneasiness; the tongue continued red in the centre; there was some diarrhœa, with pain in the right side in the direction of the colon.

The pulse was a little less irregular than previously for twenty-four hours after the application of the leeches; its irregularity subsequently increased daily; the limbs became œdematous, the perspirations copious; and some rigors were observed.

The sputa underwent no obvious change of appearance. The dyspnœa increased rapidly,—the patient being occasionally obliged to assume the sitting posture for relief; the pain under the right breast continued with more or less severity to

the very last day, and after a struggle of a few hours the patient expired.

Sectio Cadaveris ; *twenty-eight hours after death.*

External appearances. Serous infiltration of the lower extremities to a small amount. Red discoloration of the right side of the face, on which the body had lain.

Head. Slight sub-arachnoid infiltration ; a tablespoonful of serosity in each lateral ventricle ; no other morbid appearance.

Chest. Right lung firmly adherent to the costal pleura, at the summit and base, by means of membranous, firm, thick exudation. Between these two parts of the lungs the pseudo-membrane was separated from the pulmonary surface, forming a kind of sac traversed by filaments containing clear reddish serosity between them. At the apex of the upper lobe was an anfractuous cavity of large size, lined with a double pseudo-membrane, the denser and firmer lamina of which rested upon the pulmonary tissue, which was itself either healthy, or more or less diseased. This cavity communicated in several places with others of less size and with the bronchi. The lower lobe was engorged.—The *left* lung was free from adhesions, and contained a few unsoftened tubercles and gray semi-transparent matter in its upper lobe.—Heart and pericardium covered with a wavy pseudo-membrane, of tolerably firm consistence, upwards of one line [2 millimeters] thick ; thinner over the auricles than the ventricles, and bathed by a small quantity of clear reddish serosity. The walls of the left ventricle were somewhat thickened, those of the auricles slightly attenuated on the contrary. Aorta and its chief branches of vermilion-red colour, the consistence and thickness of its coats remaining natural.

Abdomen. Nearly three pints and a half [2 litres] of clear serosity in the cavity of the abdomen. Stomach of large size ; its mucous membrane thickened, very soft, and of violet-red colour at the fundus ; grayish, mammillated, thicker and firmer than usual elsewhere.—Mucous membrane of the small intestine double its natural thickness throughout the upper three fifths of its length, everywhere of natural colour and consistence ; three very small ulcerations near the ileo-cæcal valve.—Mucous membrane of the large intestine very much softened throughout ; of a pale pink colour in the descending colon and rectum, covered with a number of small ulcerations from one to two

lines [2 to 4 millimeters] in diameter each, diminishing in number from the cæcum to the anus.—Mesenteric glands healthy.—Liver large, gorged with blood, of grayish yellow colour, studded with points of bright red; bile contained in the gall-bladder not thick, and of clear colour.—Left kidney double the natural size; the right much larger still, at least quadruple the usual size, uneven, tuberculated, almost completely converted into a membranous sac, divided crosswise by a septum, itself perforated in the centre, and filled with a clear fluid resembling urine. No traces of the proper renal tissue to be found, except at the convex border of the organ, where it was from two to three lines [4 to 6 millimeters] thick.—A vesicular polypus, of the form and size of the uvula, seated in the neck of the uterus.—Other viscera healthy.

The mucous membrane of the stomach exhibited two very distinct changes here : of these one, namely, the redness with thickening and softening of the portion investing the fundus, was recent,—the other, the mammillation affecting the remainder of its surface, was the result of an affection of old standing. We might be inclined to ascribe to the latter the loss of appetite experienced from the outset of the patient's illness; but we shall presently see that this mode of viewing the matter, which under certain circumstances is sufficiently admissible, is far from being demonstrated to be correct. As regards the epigastric pain and nausea from which the patient suffered nearly a month before death, they assimilate the present case to those considered in the preceding sections, indicate the presence of a morbid state much less chronic than the mammillation (which its gray colour proved to be of old standing), and must be referred to inflammation of the fundus.

It is besides very remarkable that, in spite of the coexistence of such numerous and serious anatomical changes, the lesion in question should have given rise to symptoms so marked, such as no doubt would have occurred had the gastritis been simple, —and that those of pleurisy, phthisis and pericarditis, were no less decided.

It is presumable that the fever at the outset of the disease was the simple result of the development of pulmonary tubercles; for the various complications did not manifest themselves

till long after that period, and I shall hereafter relate some cases of simple phthisis, (Cases L, LI, LII,) in which the fever set in at the same time and with still greater intensity.

§ 4. *Gastric symptoms in subjects in whom the mucous membrane of the stomach exhibited simple ulcerations.*

This condition of things, as I have already said, presented itself to my notice in two instances only. In the case in which there was only one ulceration, about seven inches and three lines [18 centimeters] large, the patient had experienced pain at the pit of the stomach, becoming worse after meals, for the last three months of existence. During the same time the appetite had gradually failed, and digestion become a slow and laborious process. The other case I shall here relate.

Case XIV. A young girl, aged 19, of quick sensibility, and of weak and delicate constitution, always of spare habit, not having yet menstruated, and subject to shortness of breath from infancy, was admitted into the Hospital of La Charité on the 24th of February, 1824. She had then been three years ill. The affection had commenced with very severe hemoptysis, recurring on two successive days, and treated by bloodletting. Subsequently this hemorrhage had reappeared every two or three months, more frequently in winter than in summer,—the last had occurred thirty days before ; upon each occasion the patient felt as if she vomited the blood. Cough and expectoration set in with the hemoptysis, and had not ceased since ; the dyspnœa had made considerable progress, and occasionally the patient had suffered from pain in the chest. Nausea had occurred with some frequency from the outset, and sometimes even vomiting, during fits of coughing. On many occasions, too, there had been slight diarrhœa, lasting a few days, or one or two weeks, and accompanied with colic pains. The appetite continued tolerable. For the last year rigors were of frequent occurrence ; and for the last fifteen days there had likewise been evening hot fits and night-perspirations. There had been no particular thirst ; and the patient affirmed she had lost but little flesh.

February 25th. *Present state.* Face and body generally pale; appetite somewhat diminished ; tongue slightly whitish ; epigastrium free from pain; stools natural and few in number; respiration moderately quick ; oppression but slight ; the cough fre-

quently dry, more troublesome by night than by day, excites nausea and sometimes even vomiting. Thick, greenish sputa in small quantity, at the bottom of a clear fluid like saliva. Chest sonorous everywhere; abundant large crepitation over a surface four inches and eight lines [12 centimeters] in width, under the right clavicle; at the corresponding point posteriorly the respiration was tracheal; here too there was imperfect pectoriloquy, which existed in an evident manner on the left side; pulse rather frequent; heat of skin moderate.

Infusion of violets; she is to sit over hot water and have six leeches to the external genitals; quarter of house-allowance.

The progress of the affection was slow but continuous. From the commencement of March the appetite failed considerably: a sensation of weight was experienced at the pit of the stomach after eating, and there were almost constant attacks of nausea and of vomiting after or in the intervals of fits of coughing. There was a little bile sometimes mixed with the matters vomited; and during the whole month, the mouth was almost invariably clammy and bitter, the tongue whitish in the centre and somewhat red at the edges. In April the symptoms became more severe; the most emollient fluids caused distressing sensations at the pit of the stomach, and were sometimes even rejected by vomiting. Sometimes also, though much more rarely, the patient vomited small quantities of pure bile. There was almost constant nausea, the appetite had almost completely disappeared, the expression of the countenance seemed sad, the temper cross, and a state of anxiety often came on. The thirst became extremely urgent. The appearance of the tongue remained the same as during the previous month; no epigastric pain occurred at any period. The same symptoms remained in activity until the fatal termination, which occurred on the 12th of May.

The stools became soft towards the close of March, and liquid at the beginning of April, and continued in this state, varying in number from three to four daily, till the close. She had very little colic pain.

The dyspnœa made rapid progress; the cough was invariably more troublesome by day than by night; the sputa nummulated and ragged from the month of April; became greenish, flat, and puriform after the 1st of May. The sound of the chest under percussion was very obscure anteriorly on the left side

towards the close of April. From the 18th of March onwards, tracheal respiration and pectoriloquy were audible under both clavicles, and in the corresponding spots posteriorly. There was very large subcrepitant rhonchus invariably present over a considerable surface under the right clavicle, and occasionally mixed with gurgling. At the close of April both these rhonchi were heard on the left side also, at first anteriorly, afterwards posteriorly, over almost the entire surface of the chest; and this continued to the end. There were occasional pains felt in the left shoulder, on the right side of the chest, and in the larynx.

The heat of skin became very considerable, and the night-perspirations very copious; rigors were of but rare occurrence; the pulse attained great frequency from the end of April.

She suffered from constant headache of greater or less violence, and from the 20th to the 30th of April complained of a continual and insurmountable inclination to sleep. These symptoms disappeared spontaneously. During the last twenty-four hours there was slight delirium; the patient's strength gradually failed, and from the middle of April she ceased to leave her bed.

She had nine leeches to the genitals on the 18th of March, and with few intermissions took a gum-potion with three quarters of a grain [5 centigrammes] of extract of opium every day; when the diarrhœa became considerable she took white decoction with diascordium; she eat only a few rice-creams, and often nothing in the day for the closing six weeks.

Sectio Cadaveris; *thirty hours after death.*

External appearance. Last stage of marasmus; no œdema.

Head. Brain and appendages perfectly healthy; scarcely so much as a small spoonful of serosity in the lateral ventricles.

Neck. Larynx and epiglottis natural; mucous membrane of the trachea more or less bright red inferiorly, but of good consistence.

Chest. A few adhesions at the apex of the right lung; the left perfectly free from them; both organs are of rather large size, of delicate pink colour, mixed with violet, more especially on their posterior surface. The upper lobe of the left lung was hard, and exhibited eminences of yellow colour on its surface, corresponding to small tuberculous cavities; these were separated from the pleura but by a very narrow space. The main

substance of the lobe had given place to softened tubercles partially evacuated, with gray semi-transparent matter, or red, granular hepatized tissue between them. At its apex appeared a cavity of the size of a walnut, communicating with numerous bronchi considerably dilated. The inferior lobe presented a moderate quantity of tubercles in its interior; its tissue was slightly engorged, deficient in cohesion, and easily torn. A cavity, four times larger than that of the left lung, existed at the summit of the right; in the remainder of the upper lobe appeared gray matter, a few tubercles, and a little healthy tissue.—Bronchi red like the trachea, slightly or not at all thickened; bronchial glands large, not tuberculized.—Heart and aorta natural.

Abdomen. Stomach, somewhat smaller than natural, contains a small quantity of yellowish liquid. Mucous membrane smooth, white, and, in the neighbourhood of the pylorus, covered with thick mucus: except in this region, and in a small portion of the fundus, it was covered with numerous ulcerations of from one to two lines [2 to 4 millimeters] in diameter; there were from seventy to eighty of these; but the mucous membrane was not completely destroyed in some of them; in these it was only attenuated, the attenuation exhibiting itself in the form of bands, from two to four lines [4 to 8 millimeters] broad. The colour of the tunic was white, and its consistence natural throughout, and, except in the ulcerated and attenuated spots referred to, its thickness was natural.—Mucous membrane of the small intestine perfectly healthy.—That of the cæcum exhibited some red spots, and was very much softened and puffy in some places. In the colon its consistence was but slightly below the natural standard.—Mesenteric and meso-colic glands in no respect remarkable.—Liver pale, of slight consistence, and natural size.—Uterus, only one inch and two lines [3 centimeters] broad, and five lines [10 millimeters] thick.—Other viscera sound.

In the majority of cases where the mucous membrane of the stomach is ulcerated, it is found more or less thickened or mammillated in the interspaces between the ulcerations; but in the case before us it had retained its natural colour, thickness, and consistence. The ulcerations looked as if punched out;

and the mucous membrane appeared elsewhere as if it had never been in the least diseased. The symptoms observed during life were, however, of considerable severity, and made it impossible to doubt the existence of some important alteration of the mucous membrane of the stomach. There was no epigastric pain, but nausea and vomiting set in long before death, and continued persistently till the fatal termination; in spite, indeed, of the chronic course of the affection, it was far from being latent.

The reader will no doubt have remarked, that, notwithstanding the existence of diarrhœa for several successive months, the mucous membrane of the small intestine was perfectly healthy, and that of the colon only a little less firm than natural. It is extremely probable that the diarrhœa was kept up in this instance by modification of secretion arising independently of inflammation.

When the *mammillated state* which we have considered was the sole existing morbid change of the mucous membrane of the stomach, I have not observed any symptoms referrible to it with certainty, and by means of which it might be recognized during life. In some subjects the appetite failed from the outset of the disease,—in others towards the middle of its course; more rarely it contiuued good almost at the close. A few patients had had nausea and vomiting at distant intervals; one complained temporarily of epigastric pain; in three others the pit of the stomach was somewhat tender under pressure. But this slight tenderness in the epigastric region is pretty frequently observed in the course of acute pulmonary catarrh, in subjects whose stomach is healthy, where the cough is incessant; here too it in all probability was an effect of the frequent cough, and for this reason it cannot justly be taken into consideration as a symptom of the morbid change in question.

I have instituted a comparison between the symptoms now passed in review and those of the same kind experienced by patients in whom *the mucous membrane of the stomach was perfectly healthy* in respect of colour, consistence, and thickness. Taking the two series of cases together I found no difference. In the patients belonging to the latter, as to the former category, anorexia set in at variable periods; and some patients had nausea and vomited, always at distant intervals of time.

The more or less complete failure of appetite in subjects having the mucous membrane of the stomach in a healthy state shows that anorexia, even when of protracted duration, does not warrant us in concluding that gastritis exists; that this symptom, unconnected with pain at the epigastrium, nausea and vomiting is of little importance in respect of the diagnosis of that disease; and further, that a function may be disordered for a very long time, without appreciable alteration of the structure of the organ performing it.

Besides, if mammillation of the mucous membrane of the stomach be commonly, as I believe it to be, an effect of chronic inflammation, we can readily understand how difficult it must prove to detect its symptoms, in persons labouring under an affection (phthisis) in the course of which the functions of the stomach are disordered, even when its mucous membrane is perfectly healthy. This would doubtless not be the case, where the disease existed without complication; at least this is rendered presumable by the fifteenth Case. (p. 207.)

When the *mucous membrane of the stomach was more or less red throughout, and free from change in respect of thickness and consistence,* I have not observed gastric symptoms of any significance until the closing days of life. These were epigastric pain and nausea, two or three days before death,—symptoms arising, no doubt, from recent inflammation, as might be inferred besides from the nature of the morbid change.

To resume :—Symptoms of greater or less severity were observed in connexion with the majority of anatomical changes of the mucous membrane of the stomach. When it was softened and attenuated, loss of appetite, nausea, bilious vomiting, and pain at the epigastrium, almost invariably occurred, and this long before death. When its anterior surface only was inflamed, the symptoms were much less severe, generally speaking fewer in number, and of shorter duration; the loss of appetite was more or less complete,—nausea and epigastric pain existed, but to a moderate amount only, and vomiting occurred in one fourth of the cases. The symptoms were the same in cases of ulceration,—whether there were numerous small ulcers present, or a single one of large size. When inflammation was limited to the fundus, no vomiting occurred; and nausea and epigastric pain very rarely

supervened: this absence of symptoms, in a great number of cases, leads to the impression that the inflammation in question commonly came on during the closing days of life, and perhaps even, in some instances, like pneumonia or pleurisy, during the last twenty-four or forty-eight hours. I could detect no symptom positively indicative of mammillation of the mucous membrane. When it was red throughout, and unchanged in regard of thickness and consistence, some of the patients had experienced nausea and epigastric pain for two or three days before death.

This simple statement of facts shows very clearly, it appears to me, the view which ought to be taken of the vomitings which occur in the course of phthisis,—vomitings hitherto regarded as one of the symptoms of the disease. When preceded for a variable time, by more or less complete loss of appetite, and accompanied with epigastric pain, they must be regarded as the evidence of morbid change, generally speaking, of a very serious character, of the mucous membrane of the stomach: such is their more common signification. In more rare instances, they are ascribable solely to cough, but then there is little or no pain in the epigastrium, the appetite is good, and the digestive powers in excellent order. Generally, too, when of the latter kind, they occur at the outset of the disease; whereas, when indicative of an affection of the stomach, they are almost invariably observed at a more or less advanced period of phthisis.

Nevertheless here, as in a multitude of other instances, cases occur which defy the sagacity of the observer, and form exceptions to the most general laws. Thus, for the last month of his life, one of my patients had epigastric pain and nausea, and vomited either during fits of coughing or independently of these, although the mucous membrane of the stomach was perfectly healthy.

I shall terminate the account of the symptoms connected with anatomical changes of the gastric mucous membrane in phthisis with the narratives of two cases,—one of which seems to me to exhibit the characters of chronic gastritis, with an appearance of cicatrized ulceration,—the other those of total destruction of the muscular coat in a place, where the corresponding submucous and mucous tunics were still in existence.

Case XV. A shoemaker, aged 34, of middle stature, of

rather weak constitution, and addicted, during childhood, to masturbation, was admitted into the Hospital of La Charité on the 12th of July, 1824. Habitually enjoying good health, he had never suffered from a serious attack of disease, was not subject to cold, considered himself ill for a year and a half, had ceased to work for the last five months, and ascribed his illness to affliction, from the loss of his savings. His illness commenced by diarrhœa, of no great severity, accompanied with almost total loss of appetite. These symptoms had continued with uniform severity for eleven months, without fever, nausea, or vomiting, but sometimes associated with slight epigastric pain. Subsequently, the patient was seized, without assignable cause, in the midst of the night, with abundant hemoptysis, calculated at about three quarters of a pint [about half a litre] which recurred on the two following days, and appeared to yield under the use of strongly acidulated drinks. Cough, expectoration, and dyspnœa now supervened; vomiting even frequently occurred after coughing, and from this period the diarrhœa ceased. The appetite shortly after returned, the vomiting ceased, and during the last four months night-sweats occurred, rarely preceded by rigors. At no period had there been pain in the chest.

July 13th. *Present state.* General pallor of the skin; loss of strength considerable; pains in the limbs; thirst variable, sometimes there is none; tongue natural; epigastrium free from pain; one stool daily, of good consistence; pulse small and weak, moderately frequent; heat of skin moderate in the day, considerable by night; night-sweats; noisy, cavernous-like respiration all round the summit of the left side of the chest; the respiration is natural, and unaccompanied with rhonchus, everywhere else; speech short; slight oppression of breathing; sputa greenish, small, ragged, few in number; considerable emaciation.

Ptisan of Iceland moss; gum potion, julep; one quarter of house allowance.

From this to the 8th of August, neither nausea nor vomiting occurred; the appetite improved, and digestion became easy. The evening exacerbations of heat, with occasional night-sweats, continued; the dyspnœa diminished, but no improvement took place in the patient's strength.

He left the hospital at this time, and on the following day

the cough greatly increased, the vomiting recurred, and he lost his appetite. He resumed his former place in the wards, and I had him under my observation from the 10th of August to the 2d of November, the day of his death.

The vomiting ceased, and did not again return; the loss of appetite continued only for a few days, and he shortly recovered such appetite as he had before he left the hospital; it failed again, however, on the 2d of October, when diarrhœa commenced, and thenceforth continued wretched. There was no pain in the epigastrium, and the diarrhœa, which came on in a severe form, accompanied with failure of strength, and rapidity of pulse, very shortly diminished in abundance. The tongue was almost always slightly red and violet-coloured; the skin very hot in the evenings and nights; sweating and rigors were of rare occurrence.

September 22d. The chest emitted a very dull sound on percussion under the left clavicle; the space in which this dulness of sound was observable gradually grew of larger dimensions, in such manner that, by the middle of October, the sound was dull over the whole anterior surface of the left side of the chest. At the same period the respiration was tracheal under the clavicles, and soon after gurgling became audible.

The patient's debility suddenly underwent a very considerable increase on the 1st November, and on the 2d he expired at 5 p.m.

He had for some days rice-water, and subsequently, infusion of violets; during the last month he scarcely eat anything but a little soup, or a few rice-creams.

Sectio Cadaveris; *forty hours after death.*

External appearances. Last stage of marasmus; nothing else worthy of note.

Head. Slight sub-arachnoid infiltration; one table-spoonful of serosity in each lateral ventricle; somewhat less at the base of the skull; brain soft and vascular.

Neck. Epiglottis natural; larynx pale, presents two superficial ulcerations, one at the junction of the chordæ vocales, the other on the left lower chorda vocalis.—Mucous membrane of the trachea somewhat red, studded with a great number of ulcerations, about one line [2 millimeters] in diameter; no thickening of their edges, or in the interspaces between them. Some similar ulcerations in the bronchi of the left lung.

Chest. Slight adhesions at the apices of both lungs. Upper lobe of the left, compact in great part, presents two large cavities lined with semi-cartilaginous pseudo-membrane of grayish colour and not perfectly opaque, and filled with greenish matter, the same as that found in the bronchi; rest of the lobe converted into semi-transparent grayish matter, in the midst of which were several small cavities, partly emptied—several of them only separated from the pleura by a very thin lamella. The lower lobe presented a little gray semi-transparent matter in its upper part, associated with tubercles.—The morbid appearances were of the same nature, but less extensive and less marked, on the right side.—Heart healthy; white semi-cartilaginous patches in great number in the walls of the aorta.

Abdomen. Stomach of moderate size, somewhat contracted in the middle: mucous membrane of tawny colour in the fundus; more or less grayish everywhere else, and studded with whitish specks measuring from one to two lines [2 to 4 millimeters] in diameter; here the mucous membrane was thin. One of these specks was much less white, slightly grayish, oval, measuring seven lines [14 millimeters] in length, by five lines [10 millimeters] in breadth, and was equidistant from the cardiac orifice and pylorus, near the small curvature, and on the posterior surface of the stomach. The mucous membrane did not cover this, but terminated insensibly at its circumference being bevelled off to a width of two lines and a half [5 millimeters]. The line of demarcation was the less appreciable, because the grayish colour of the membrane was almost identical with that of the sub-mucous tissue forming the speck; so that when the entire mucous membrane was removed, the interior of the stomach generally appeared white, except at this spot. The latter was also surrounded with a flattened ring of little thickness, and about one line [2 millimeters] broad, formed of sub-mucous cellular tissue more closely adherent to the muscular coat in this point than anywhere else. Where attenuated the mucous membrane was somewhat less consistent than in other parts. The muscular tunic was perfectly free from anatomical change.

The mucous membrane of the small intestine, natural in consistence and thickness, exhibits several narrow ulcerations, of the form of a button-hole, running transversely in its upper

part; in its lower fourth a considerable number of yellowish granulations, of tuberculous appearance, ulcerated at their summit, and of the size of a small pea, or less.—Numerous ulcerations covering a surface varying from three inches and two lines to three inches and seven lines [8 to 9 centimeters]; smaller in the rectum than elsewhere. The surface of the majority of them was rendered uneven by the prominence of the fasciculi of the muscular fibres, which were laid bare and about half a line [1 millimeter] thick in the corresponding place. Around them the mucous membrane was red and thickened,—elsewhere perfectly healthy.—The meso-colic glands, of the size of a large pea, were yellowish, tuberculous, and firm; the mesenteric natural.—There was only one kidney,—this was placed on the right side, and was double the usual size; there were two hili, one placed anteriorly, the other in the internal edge of the organ—and two small pelves, which terminated after a short transit in a single ureter.

The failure of appetite occurring in this case eleven months before the commencement of cough, and at a period when, to all appearance, no tuberculous affection of the lungs yet existed, no doubt depended upon chronic inflammation of the mucous membrane of the stomach, leading to attenuation and partial destruction. In ordinary cases, when this membrane is destroyed to any extent, the part adjoining the ulceration is in the natural state, or at least neither attenuated nor thickened; the sub-mucous tissue forming the fundus of the ulceration undergoes no change of colour, though it is sometimes a little thickened or partially destroyed, as we have seen in certain instances, (Case XXXVIII;) and it does not form an elevated ring round the mucous membrane. The difference of these characters from those of the ulceration existing in the case before us, I am inclined to think may, in conjunction with the symptoms, be regarded as proving that gastritis of extremely chronic course had been present, terminating in ulceration of the mucous membrane, which subsequently cicatrized more or less completely. It will, perhaps, be objected, that had this really been a cicatrix, the mucous membrane would have protruded beyond the elevated ring; but to this I may reply, that in the few individuals in whom I have found evident cicatrices

in the small intestine, the mucous membrane invariably stopped short at the edge of the ulceration.

I may further observe with respect to this cicatrix that, of about thirty cicatrices observed by myself in the stomach within the last fifteen years, every one exhibited precisely the character above described, and were, like it, invariably seated on the posterior surface near the lesser curvature, and never on the anterior surface. The particular case we have been considering is thus evidently one of a series of similar ones, and in nowise special or exceptional; and we may conclude that simple non-cancerous ulcerations of the stomach follow a different course and obey different laws from the cancerous variety, the most common seat of which is, as is well known, the pylorus.

However, I have been recently shown a stomach, furnishing an exception to the general law; the pyloric region, close to the pylorus, was here the seat of an obvious cicatrix, extending all round the orifice, and measuring nearly an inch and two lines [3 centimeters] in height.

Case XVI. A woman, aged 49, by trade a gold-wire-drawer, of rather weak constitution, and not subject to colds, was admitted into the Hospital of La Charité on the 13th of July, 1824. She had been ill for a year, and had ceased to work for the last five weeks: the outset was marked by general sense of uneasiness and feebleness, failure of appetite, and loss of flesh. This state of things had existed for five months, when cough, expectoration and dyspnœa set in,—symptoms which thenceforth continued uninterruptedly. Complete anorexia and diarrhœa were conjoined with the former symptoms, for the last month; pain and pricking sensation in the chest came on during the fourth month of the cough, and had continued to a greater or less extent since. There had been neither hemoptysis, night-sweats, nor epigastric pain; and rigors had been of rare occurrence.

July 14th. *Present state.* Considerable feebleness, extreme emaciation; œdema of the lower part of the legs; tongue somewhat red at the point; mouth clammy, and sometimes with a bitter taste; thirst variable; almost complete anorexia; marked tension and resistance in the epigastrium, extending over a surface, six inches [15 centimeters] long, under the right false ribs,

unaccompanied with any pain in the part; epigastric pulsation for the last few days; one liquid stool; slight tension of the hypogastrium; cough frequent in the morning; a few greenish opaque sputa; on the right side the chest emits no sound under percussion anteriorly; the same was very much the case posteriorly also, on this side; tracheal respiration, gurgling and pectoriloquy existed under the right clavicle, over a considerable extent of surface; reclining on the right side, brought on cough, and increased the dyspnœa; pulse tolerably full, and moderately frequent.

Rice ptisan, with syrup of quinces; gum potion; three rice-creams.

During the first days of August, the loss of appetite remained unchanged, the diarrhœa increased in abundance, became actually severe, and then ceased completely; neither nausea, vomiting, nor pain in the region of the stomach occurred. The hypogastrium became the seat of a very annoying sensation of weight, especially after meals, consisting, for example, of an egg and a little bread. Slight tympanitis came on; the pains disappeared; the stools became very frequent, and remarkable for fætor during the closing four days of life, and the patient expired on the 17th of August at 9 a.m.

During the last thirty-three days this patient remained under my observation, the state of the tongue varied much; its colour, though generally speaking natural, occasionally assumed a more or less bright red hue, without any concomitant change being observed in the functions of the stomach or bowels.

There was, generally speaking, considerable heat of skin in the evening, but no perspiration; and the state of the respiration appeared, on repeated examination, very much the same as the first day.

When the diarrhœa increased in violence, the patient took diascordium with three quarters of a grain [5 centigrammes] of opium.

Sectio Cadaveris; *twenty-three hours after death.*

External appearances. Last stage of marasmus.

Head. A small spoonful of serosity in the upper part of the arachnoid; slight emphysema, without serous infiltration in the pia mater; a spoonful of serous fluid in each lateral ventricle. The inferior half of the brain less firm than the superior; the pons varolii and medulla spinalis still softer; three tablespoonfuls of somewhat frothy serosity in the lower part of the spinal canal.

Neck. Epiglottis, larynx, and trachea natural.

Chest. *Left* lung free from adhesions; its upper lobe has a knotty appearance, produced by great numbers of granulations or tubercles, softened or unsoftened, placed close to the surface. These were in abundance, also, in the central parts of this lobe; while in the inferior there were but few. *Right* lung almost universally adherent to the costal pleura, by means of a semi-cartilaginous pseudo-membrane. At the apex of its upper lobe was a huge cavity, lined with a grayish pseudo-membrane of considerable density, and half a line [1 millimeter] thick, containing a greenish matter, stained with blood, and exhibiting some short bands. The rest of the upper lobe was transformed into grayish and blackish matter superiorly,—grayish, homogeneous, hard, somewhat elastic, and more or less semi-transparent inferiorly; it was traversed by irregular semi-cartilaginous septa, and contained tubercles more or less completely softened or evacuated. The bronchi were much thicker, wider, and redder in the upper lobe of the right than of the left lung. Heart small and healthy; several yellowish patches throughout the entire tract of the aorta.

Abdomen. About two pints and a half [$1\frac{1}{2}$ litres] of reddish serosity in the abdomen—the liver protruded four inches eight lines [12 centimeters] beyond the ribs, reached lower down than the crista of the ileum, and was of firm consistence and fragile. The gall-bladder contained a deep-coloured sticky fluid. The stomach was small, adhered closely, by part of its posterior surface, to the pancreas, the tissue of which organ was much harder than natural. The mucous membrane exhibited a grayish colour, feebly tinged with pink; it was mammillated throughout, somewhat thickened, somewhat less firm than natural, along the greater curvature, and covered with viscid mucus in tolerable abundance. Near the lesser curvature, between the cardia and pylorus, and in the place corresponding to the adhesion to the pancreas, appeared a slight depression, somewhat smaller than a five-shilling piece, around which the mucous membrane was slightly puckered. In the depressed place it was very much attenuated, brittle, and non-mammillated; the corresponding cellular tunic was healthy; the muscular destroyed, and its place filled by a white semi-cartilaginous tissue, a quarter of a line [half a millimeter] thick, into which the fleshy fibres were

inserted. These were upwards of half a line [1 millimeter] thick at the point of insertion, their thickness continuing the same for a distance of four lines [8 millimeters], and, in other respects, perfectly healthy; the sub-mucous cellular tissue was indurated and thickened to the same extent.

The small intestine contained a grayish thin matter, with but little smell; its mucous membrane was slightly softened, and contained throughout a considerable number of small ulcerations, many of which were seated in the centre of the patches of Peyer. Similar ulcerations were found along the entire tract of the large intestine down to the anus; their fundus was formed of sub-mucous cellular tissue, very slightly thickened; in the interspaces between them the mucous membrane was as soft as mucus, and double its natural thickness; it was everywhere covered with a grayish reddish liquid fecal matter.—Mesenteric and mesocolic glands somewhat large, but healthy.—Spleen small; its tissue firm, and somewhat resembling that of the liver.—Urinary organs and passages natural.

The state of the mucous membrane of the stomach—the gray discoloration and mammillation affecting almost its whole extent, its attenuation in one place, its slight thickening elsewhere, and the diminution of the appetite long before the outset of the phthisical disease, are circumstances assimilating this case to the preceding one, and indicate the existence of chronic gastritis, commencing long before tuberculization of the lungs, and continuing *simple* for a length of time. In this point of view the present case is extremely interesting, inasmuch as it proves what we before had only reason to suspect, that mammillation of the mucous membrane of the stomach is, generally speaking, the product of a chronic affection, which gives rise to very obscure symptoms only. So far, in truth, we had not observed this state, except in connexion with more or less numerous complications; and the gastric symptoms not having, in the generality of cases, differed from those noticed when the mucous membrane was healthy, it was impossible to decide in what those appertaining to the state in question really consisted. The present case shows, with greater precision, that these symptoms are very obscure, and are, in the majority of cases, no doubt limited to greater or less failure of appetite and laborious digestion. I do

not say always; for we have seen that, in certain instances, when this state coexists with more or less bright red discoloration, nausea and epigastric pain occasionally occur.

The transformation of a portion of the muscular membrane into a semi-cartilaginous substance is not less worthy of attention. Without inquiring into the period at which this transformation was effected, nor the nature of the causes producing it, I may observe, that I have quite recently met with an anatomical condition very similar to this, except that instead of being converted into semi-cartilaginous tissue, the muscular membrane was changed into a fibrous tissue, half a line [1 millimeter] thick. The corresponding cellular membrane was more or less thickened.

SECTION IX.—STATE OF THE TONGUE.

After having studied the symptoms corresponding to various morbid changes of the mucous membrane of the stomach, it will be well to inquire whether some mutual influence does not exist between the state of that organ and of the tongue. My observations upon this subject may be given as follows:

In nine out of nineteen cases of softening and attenuation of the mucous membrane of the stomach, the tongue was constantly moist, and not obviously red at any period of the disease. In four of the remaining ten subjects the tip and edges of the organ were red for fifteen or twenty days only; in the six others this colour was noticed for two or three days only.

In eight cases in which the inflammation was limited to the mucous membrane of the anterior surface of the stomach, I found the tongue pale or red the same number of times; and in one instance the redness was quite transitory.

When the inflammation affected the whole or a part of the fundus, in which case it did not, in all probability—as already explained—set in till the closing days of existence, the tongue was natural in ten cases; in the seven others it was somewhat red at the edges, either towards the close of life, or at a more or less distant period from the fatal issue, for a few days only.

Eight of the nineteen subjects, the mucous membrane of whose stomach was more or less generally and prominently mam-

millated, exhibited a red state of tongue during a very variable period; in the others it remained natural.—The organ exhibited an excess of redness, for one or more weeks, in six of the fourteen other subjects presenting various morbid changes in the mucous tunic of the stomach.

Lastly, where this membrane was perfectly healthy, in respect of colour, consistence, and thickness, the tongue had been more or less red in ten out of nineteen cases; and in one of them the redness continued persistently through the whole course of the disease, was brighter than in any of the other instances before referred to, and at a certain period became dry, very much as in some cases of typhoid fever. This last case is sufficiently interesting to deserve a place here.

Case XVII. A carter, aged 25, of moderately strong constitution, had been three weeks ill when admitted into the Hospital of La Charité. He stated that, seven months before, he had had continued fever of five weeks' duration, unaccompanied with diarrhœa, that after this his health became perfectly re-established, he recovered his flesh and strength, digestion was regularly and easily accomplished, and the appetite excellent until the period when he fell ill again. During the first eight days of this new affection, he suffered from general uneasiness, almost complete loss of appetite, slight cough, and inaptitude for work; then supervened heat without rigors, night perspiration, intense thirst, complete anorexia, increase of cough, pain behind the sternum, buzzing noise in the ears when he sat up; he now became obliged to keep his bed. Leeches were applied to the epigastrium (which was not painful), without the slightest benefit.

August 3d, 1824, (the day following that of the patient's admission.) *Present state.* Face somewhat animated; feebleness considerable; tongue dry, shining, bright red at the edges, yellowish, moist and villous in the centre; thirst extreme; anorexia; bitter taste in mouth; epigastrium free from pain; the entire abdomen unaffected by strong pressure; bowels confined; pulse 75, quick and full; heat considerable; respiration not very frequent; no kind of rhonchus in the chest; pain behind the sternum from cough; sputa small in quantity, deficient in air rather than otherwise; attitude of the patient natural; uneasiness but not to a marked degree.

Lemonade; emollient enema; fever diet.

The following days the tongue was moist, clean, and very red over its whole surface; there were one or two liquid stools in the twenty-four hours; the anorexia continued, and the lemonade appearing to cause uneasiness at the pit of the stomach, simple oxymel in solution was substituted for it. The pulse was even less rapid than the first day.

11th. No obvious change in the state of the tongue or digestive passages; the solution of oxymel was not better borne than the lemonade; the patient vomited a small quantity of bile; he complained of his chest alone. Some sonorous rhonchus on the right side posteriorly.

Solution of syrup of gum.

From this time to the 8th of September, the day of the patient's death, the thirst was somewhat less troublesome, the anorexia unchanged, the epigastrium free from pain; vomiting of bile occurred on the 22d, 29th, and 30th of August. The state of the tongue varied; on the 16th it was of dark red colour, and inclined to dryness; on the 28th, to these characters was added the development of small white pultaceous specks on its sides; on the 1st of September it was even redder than usual, perfectly clean, and the seat of prodding sensations; on the 5th it became dry and unnaturally thick, conditions which remained to the end, while the redness grew daily deeper, The stools became few in number; and there was no diarrhœa till the last eight days, when, too, the abdomen became slightly tympanitic.

August 16th. The oppression of breathing had somewhat increased.—21st. The pain in the chest, the cough, and the dyspnœa were in a stationary condition, the respiration less strong anteriorly on the left than the right side; the sputa small in quantity, and somewhat greenish and opaque: and so things continued to the end.

The pulse, perfectly tranquil on the 23d of August, rose to 85 on the 26th, with proportional elevation of temperature; and this febrile state continued the following days.

From the 28th of August the patient's feebleness and emaciation made rapid progress, and he soon became unable to leave his bed. He expired quietly without delirium, and almost without death-rattle, at 4 p. m.

The treatment consisted in the exhibition of solution of syrup

of gum and the use of linseed enemata; he had leeches to the anus on the 16th of August and 3d of September, without deriving the slightest benefit from their application.

Sectio Cadaveris; *sixteen hours after death.*

External appearances. Last stage of marasmus.

Head. Slight sub-arachnoid infiltration; medullary substance of brain somewhat injected; a tablespoonful of serosity in each lateral ventricle and at the base of the skull.

Neck. Epiglottis, larynx, and trachea natural.

Chest. Pretty general cellular adhesions on both sides. The upper lobes of the lungs contain suppurating tubercles in abundance,—the right more than the left, and the anterior than the posterior parts: elsewhere there were only crude tubercles. The pulmonary parenchyma was healthy round both kinds of tubercle, and there were no semi-transparent gray granulations discernible anywhere. Bronchi thin, and of pale pink colour.—Heart and aorta natural.

Abdomen. Stomach of small size; exhibits internally a considerable number of valvular folds. Mucous membrane villous, pale, perfectly free from vascularity, and of natural thickness and consistence throughout. The entire tract of the small intestine exhibits the same pallor; the mucous membrane is here, too, perfectly healthy, with the exception of an ulceration remarkable for its pale colour, situated fourteen inches [36 centimeters] above the cæcum, and measuring one line [2 millimeters] in diameter. The mucous membrane of the large intestine was white, of natural thickness and consistence, except in the lowest twenty-eight inches [72 centimeters] where it was of a livid red colour and softened, and exhibited a great number of small ulcerations, in the midst of which was a small clot of very black blood.

The mesentery formed a sort of irregular flattened mass, an inch and two lines [3 centimeters] thick, and thirty [?] inches broad at the least, formed of an agglomeration of completely tuberculized mesenteric glands, unsoftened, and of about the size of a chesnut. Many of the lumbar glands had undergone the same transformation, but only partially.—Pancreas harder and whiter than natural; the other abdominal viscera healthy.

The absence of epigastric pain in a subject in whom the dis-

case had run so acute a course, whose intellectual faculties were perfectly sound, and who had only vomited bile a few times, diverted my attention from the idea of gastritis; and having no more than mere suspicions respecting the state of the lungs, I was at first unable to form any decided opinion on the nature of the affection. But the progressive emaciation, the redness and dryness of the tongue, and the persistence and increase of the same symptoms, led me to believe that the disease was fatal in its nature, and would cut off the patient. As under many other circumstances, the state of the tongue was of some assistance to me in regard to prognosis; and it is chiefly, indeed almost solely, for indications of this kind that observation of the varying states of the tongue can be considered practically useful. At least it must appear to every one perfectly obvious from the facts now passed in review, that there exists no necessary connexion between the state of the tongue and that of the stomach; for if there be certain cases of gastritis in which it exhibits a red colour, the contrary is of still more frequent occurrence; and, on the other hand, it is sometimes dry, hard, and very red, when the mucous membrane of the stomach is perfectly healthy.

These truths ought, indeed, to excite no surprise; they simply show that the tongue acknowledges the influence of the same laws as the rest of the system, which would not be the case did its conditions vary constantly and solely with the state of the mucous membrane of the stomach. When feverish action—be this produced by what cause it may—exists, the entire system participates more or less in the disturbance; the appetite fails, the skin becomes hot, moist, and often injected with blood; the qualities of the secretions change, the urine grows red, scalding, &c. Why should the tongue not share in these disorders? Why should we not find it more or less red, dry, moist, clean or furred, independently of any influence arising from the state of the stomach.

The loss of appetite was complete from the period of the patient's admission; a circumstance the more remarkable, because—in addition to the mucous membrane of the stomach being sound—there was very little fever at that time. This proves that the appetite may fail without fever being present, or the mucous membrane of the stomach being diseased in an appreciable manner.

With the exception of one very small ulceration, the mucous membrane of the small intestine was perfectly healthy, while the entire mesentery was transformed into tuberculous matter. How can we refuse to admit that this transformation was perfectly independent of inflammation of the mucous membrane of the bowel, in conformity with the general principle I have already established?

The tongue was in some cases the seat of an *albuminous exudation*, more deserving of attentive consideration than simple redness. This exudation occurred towards the close of the disease, four, eight, ten, sometimes even sixty days before death. It appeared in some instances under the form of patches, from four to six lines [8 to 12 millimeters] large, which, running into each other, occasionally covered the entire surface of the organ; in other instances it was deposited in small particles like coarsely-ground rice, separated from each other by spaces of variable size, in which the tissue of the tongue was uncovered. This exudation was easily removable, about a quarter of a line [half a millimeter] thick, and, generally speaking, renewed several times before death. In the majority of cases it exhibited itself simultaneously on the tongue and the different parts of the mouth, the lips, the cheeks, the gums, and occasionally even the hard palate. The tongue was almost invariably the seat of painful prodding sensations, and more or less hot and red; in some instances, however, I have seen it perfectly pale immediately under the patches even.

These different conditions, redness, heat, prodding sensations, and the albuminous nature of the exudation,[1] denote real inflammation of the mucous membrane covering the tongue. However, it has just been seen that the tongue was sometimes pale underneath and between the patches, and pallor of so vascular an organ as the tongue is with difficulty reconcilable, it must be allowed, with the idea of inflammation. We must, consequently admit that the presence of albuminous pseudo-membranes is not always the consequence of inflammation; and that in certain cases they must be regarded as an effect of alteration of secretion produced independently of phlogosis,

[1] G. Blache, Production particulière sur la Membrane muqueuse de la Bouche, qui se manifeste dans les derniers temps des maladies chroniques. Thèses de Paris, 1824.

Nevertheless, there can be no question that this exudation is almost invariably a product of inflammation of the mucous membrane; and in this point of view its existence goes to corroborate what has been already said regarding the frequency of inflammation at the close of chronic diseases.[1]

This condition of the tongue was not dependent upon the state of the mucous membrane of the stomach a whit more than simple redness. I have observed it in one eighth of the cases; three times in cases of softening and attenuation of that mucous membrane; four times when inflammation was limited to the anterior surface of the stomach; three times in subjects in whom the membrane was perfectly healthy; and twice in the remaining cases.

SECTION X.—DIARRHŒA.

Diarrhœa was of almost as common occurrence as fever in phthisical patients: of one hundred and twelve subjects, five only remained exempt from it. It varied greatly in different cases, in regard of severity and duration. In one eighth part of the cases it commenced with the outset of the phthisical disease itself, continued persistently till death, and lasted from five to twelve months. In some individuals, whose death did not occur till after from four to five years of illness, there was almost continual diarrhœa from the first to the last. In the majority it commenced during the second half of the disease; in other cases not till the closing days of existence,—so that we can consider it under two principal forms; that is, when it did not occur till near the close of life, and when it commenced at a period more or less remote from the fatal issue.[2]

Diarrhœa limited to the closing days of life. In this division I place all cases in which diarrhœa did not set in till from the twentieth to the fiftieth day before death. They formed the fourth part of the whole. In some of them the invasion of the diarrhœa was attended with slight increase of heat of surface, unusual rigors, and more or less severe colic pains; more commonly, none of these symptoms occurred. Generally speaking

[1] See the Summary of the First Part, p. 149.

[2] The analysis which follows bears only upon the ninety-five cases in which the mucous membrane of both intestines was carefully examined.

the stools were few in number. In such cases as I was enabled to examine the evacuations they were of yellowish colour, pultaceous, generally composed of a very clear liquid, free from mucus and blood, in the midst of which appeared some small masses of more or less solid matter. They were not remarkably fetid.

In all these cases, except one, the mucous membrane of one and other intestine presented some kind of alteration. In one half of the individuals there were ulcerations in the small intestine or colon, or in both; but, with the exception of one case, where the small intestine, and two where the colon, were respectively the parts affected, these ulcerations were small, and few in number. In four fifths of the subjects the mucous tunic of the large intestine was as soft as mucus, and almost invariably more or less red.

There was an exact correspondence between the symptoms and the changes of structure to which they were ascribable. For just as the diarrhœa had lasted but a few days, at the period of the patient's death, so the ulcerations and softening of the mucous membrane of the colon appeared equally recent. As regards the ulcerations, they were small, and the sub-mucous tissue forming their fundus very thin; and, on account of the constant tendency of intestinal ulcerations to enlargement, and of the tissues forming their fundus to thickening, they could not be considered otherwise than very recent. With respect to the softening, accompanied or not with redness of the mucous membrane of the large intestine, I may observe that it exists to the same amount in subjects who perish in a few weeks from dysentery, in a perfectly uncomplicated form; and that, in the majority of cases, it was the evident result of inflammation. The invasion of the inflammation was marked in several instances by slight febrile reaction, and more or less acute pain accompanying the liquid stools. And in cases where pain and febrile symptoms were absent, the outset of the affection must still be admitted to be coincident with the establishment of the diarrhœa, inasmuch as we should otherwise be compelled to admit what cannot be admitted, namely, that colitis (inflammation of the colon) is almost always a latent affection. Everything, consequently, goes to show that the small ulcerations, and softening in question, or the inflammation to which they were commonly attributable, were of very recent origin.

If it be impossible to believe that so serious a change as pulpy

softening of the mucous membrane of the large intestine can be almost always latent, it is nevertheless conceivable that it shall occasionally assume this character; I in fact possess notes of three cases of the kind. With the softening there coexisted in one case tolerably bright redness of the mucous membrane; there had been no abdominal pain.

The diarrhœa was less severe in cases where ulceration existed without softening of the mucous membrane, than in instances where the latter alone was present,—a circumstance easily foreseen from the difference of severity of the two kinds of morbid change.

Protracted diarrhœa presented itself under two chief forms; it was *continuous* or *remittent*.

The duration of the remittent form varied from fifteen months to forty-eight days; the remissions were of variable length, eight, ten, fifteen, or twenty days; the stools were commonly few in number. Colic pains, of rare occurrence on the whole, existed in fifteen cases; ten of the patients had ulcerations in the small intestine, six in the colon,—and with the exception of two cases for each intestine, they were small. The mucous membrane of the colon was excessively soft in ten cases, and in three of these red and thickened besides. Hence this series of patients presented the same morbid change, and in about the same state of advancement as the preceding group, consisting of individuals whose diarrhœa had set in, I may say, but a few days before death. It would appear natural from these facts to believe, that in the cases now in question, the apparent alterations of texture played the least important part in the production of the diarrhœa; that, further, these alterations had in the present as in the former series of cases, formed during the closing days only of life, and that at an earlier period the diarrhœa had been the result of a simple alteration of secretion, as we have already seen to be the fact with cutaneous perspirations.

Protracted and continuous diarrhœa lasted from one to twelve months, sometimes even more. It was more or less violent, and generally speaking attended with colic pains. In one case, where it lasted five months (Case IV), there were not less than from twelve to fifteen stools, and these often copious ones, every day. Of the forty-one subjects who suffered from this form of diarrhœa, thirty-five had ulcerations in the small, and thirty-one in the large intestine. In twelve instances the ulcerations of the

small intestine extended along its entire tract. They were of considerable size, of about an inch and two lines [3 centimeters] in diameter in thirteen subjects; and in these persons occupied the whole or a part only of the tract of the bowel. In nineteen cases there were extensive ulcerations of the large intestine, and in thirty softening of the mucous membrane, with coexisting redness in seventeen of these. Hence, as a general fact, when the diarrhœa was protracted and uninterrupted, there were extensive and numerous intestinal ulcerations; that is to say, alterations of the same character, but more advanced, and produced at an earlier period than in those cases, when the diarrhœa had only been of long duration without being continuous.

There were extensive ulcerations of one and the other intestine in six subjects in whom the diarrhœa had been severe and continuous, for two, three, five, and eleven months. In the other cases there were none of large size except in the small intestine or colon. When the ulcerations were limited to the small intestine, the diarrhœa had not been the less protracted or the less continuous,—a manifest proof that such diarrhœa cannot be considered the exclusive effect of anatomical changes of the large intestine. However, it must be admitted, that the latter was the principal source of diarrhœa, at least of that observed during their closing days, in phthisical subjects, inasmuch as the mucous membrane of that portion of the bowel was much oftener softened and inflamed than that of the small intestine. But it would be extraordinary indeed if affections of the large bowel were the *sole* cause of diarrhœa, since in typhoid fever,—a malady almost invariably attended with this symptom—the principal, and pretty frequently the only, textural change in the intestinal canal is seated in the small intestine.

In order to justify the observer in predicting with any confidence the existence of extensive and numerous ulcerations, the diarrhœa must not only have been protracted and continuous, but the stools must, besides, have been numerous. In many cases, in truth, in which the last condition was wanting, although the diarrhœa had lasted one or more years uninterruptedly, the ulcerations were of very small size.[1] But I have not met with

[1] These cases confirm the justness of what I have said upon errors of secretion as the probable cause of diarrhœa in many cases.

any case of protracted and continuous diarrhœa during which the alvine evacuations were frequent, without discovering large intestinal ulcerations. The examinations of the fæces would further add to the certainty of the diagnosis; for, as was stated in the First Part, their colour was completely changed, and their odour like that of animal substance in maceration, when the ulcerations were of large dimensions and numerous.

When the ulcerations of the rectum were small they had no influence on the character of the diarrhœa. Under the contrary circumstances, and more especially when they were seated near the anus, the alvine evacuations were extremely frequent, mucous, accompanied with tenesmus, sometimes bloody, and generally speaking, involuntary.

In all cases the loss of strength and emaciation were proportional to the number and frequency of the stools.

I shall hereafter recur to this symptom—which cannot be studied with too much care—when engaged with the subjects of the diagnosis and progress of the disease.

I shall next pass to the consideration of the symptoms accompanying chronic or tuberculous peritonitis.

SECTION XI.—CHRONIC PERITONITIS.

The symptoms of chronic peritonitis, an affection I have only met with in tuberculous subjects, are, generally speaking, of slight consequence, few in number, and pretty frequently pass unnoticed, although, as we shall presently see, they suffice for the positive diagnosis of the affection upon which they depend.

At a variable period of the principal malady, sometimes at its very outset, and whether it prove fatal in less than two months, or in several years, the patients present, as the earliest symptom of peritonitis, an increase in the size of the abdomen, (shown by their feeling uncomfortable in their clothes, when they are not confined to their beds,) or slight abdominal pain, sometimes extending over the whole cavity; or, in other cases, both these symptoms simultaneously. The pain increases under pressure and percussion, is unconnected with diarrhœa, which is far from being present in every case at the time the pain sets in, and is, besides, attended with sufferings of a very different

character from those of peritonitis. Subsequently, after the lapse of a variable time, the existence of fluctuation or tympanitis, more or less considerable in amount, may be detected. After having increased for a certain time, the fluctuation diminishes and then disappears completely, while the tympanitis remains persistently. In cases where it occurs at the outset, without appreciable effusion, the tympanitis diminishes after a certain time, and then the tense resistance of the abdomen becomes more marked, the form of the convolutions of the intestine becomes visible externally, the abdomen appears nodulated and is extremely elastic, even when the muscles of the abdominal parietes are in a state of complete relaxation. Nausea and vomiting are of rare occurrence, unless it be towards the close of the affection, when acute peritonitis adds new misery to the condition of the patient. In some cases when acute symptoms do not supervene the suffering is no less severe,—the patients think and speak only of the state of their abdomen. (Case VII.) In other instances where the anatomical changes are quite as considerable, the abdomen remains invariably free from pain, even under pressure, and the only symptoms ascertainable are increase of size and fluctuation,—the urine not being albuminous, and no evidence of organic disease of the liver having so far existed.

The symptoms now described continue, in greater or less number, till the fatal termination, at least such is usually the fact; but in a certain number of cases in which the disease runs a very chronic course, the symptoms of peritonitis, after having proved the source of protracted distress in the abdomen, disappear, and the chest becomes the sole seat of suffering. (Case XXII.)

The liquid effused into the abdomen may be rapidly absorbed —in the space of seven or eight days for example—and the observer is sometimes astonished at not finding a drop of serosity in the abdomen, at the post-mortem examination, but instead of this, general adhesions, composed of soft pseudo-membrane, in subjects whose abdomens had been the seat of manifest fluctuation a few days before.

These symptoms, notwithstanding their being few in number, and of slight apparent severity, acquire great diagnostic importance from the invariableness of their course. When they

are associated there can be no doubt of the existence of tuberculous peritonitis; and they lead us, secondarily, in the adult at least, to the diagnosis of pulmonary tubercles. I have, in this way, been led more than once to the diagnosis in question, in individuals who coughed little or none, and whose chests, examined with extreme care, by means of percussion and auscultation, presented no obviously unnatural condition.

Tuberculous might, however, in some cases, be confounded with cancerous peritonitis,—a variety of the affection which also runs a chronic course. But the latter variety is attended with much less fever than tuberculous peritonitis; it does not occur at the same periods of life; it is not accompanied with diarrhœa and cutaneous perspiration; it occurs secondarily to the development of cancer in some other organ, and the disturbance of the functions of that organ must serve as a guide to the observer: if these various points of distinction will not always suffice to prevent the commission of error, they must at least very materially aid in preventing its occurrence. Tuberculous peritonitis is besides much more frequent than the cancerous, and tubercle and cancer very rarely coexist in the same individual,—additional facts tending, when coupled with cautious and careful investigation of the different organs, to ensure correct diagnosis.

The following cases will make the reader still more perfectly acquainted with the character of this affection.

Case XVII.* A gardener, aged 26, with light chesnut hair and freckled skin, was admitted on the 13th of July, 1826, into the Hospital of La Charité. Of moderately strong constitution, having enjoyed constant good health for the last six years, with the exception of a few colds of from a week's to a fortnight's duration, he considered himself ill for four months, during the last two of which he had been worse than before.

The invasion was marked by dry cough, soon followed (in the middle of April) by abundant expectoration. At first rather troublesome, the cough became less so from the commencement of May. At the same time the patient began to suffer from general and continuous abdominal pain, which was somewhat less sharp in the epigastrium and immediately below this than elsewhere. This pain, accompanied with slight heat of skin and

rigors, diminished in June, after bloodletting and the application of some leeches below the ensiform cartilage; there was neither nausea nor vomiting. When admitted the patient stated that the abdomen had not been swollen at the time the pain came on, that he had only had diarrhœa temporarily, when he eat fruit. The appetite, which had continued pretty good, until the abdominal pain set in, had since failed.

July 13th. *Present state.* Intellectual faculties and memory in full vigour; he had walked into Paris from Versailles, (in four hours,) wishing to avoid the jolting of a carriage, which increased the abdominal pain. Slight thirst; tongue whitish; abdomen a little fuller than natural below the umbilicus; entire surface somewhat painful, more especially under pressure, and still more so under percussion; slightly less yielding than natural, particularly below the umbilicus, where it emitted a dull sound. Pulse 68, regular; skin dry and hot; respiratory murmur harsh (but not manifestly bronchial) at the apices of both lungs, more especially posteriorly, and on the right side, where the voice resounded more than in the natural state. No cough for the last eight days; the spitting vessel contains a very little dried frothy mucus.

Barley-water, sweetened with honey; emollient lotions; three half rice-creams.

From the 13th to the 20th the pain diminished, and the patient had one, rarely two stools, in the twenty-four hours; the appetite improved somewhat, and on the 20th the whole abdomen emitted a dull sound, and was somewhat arched above the umbilicus. The pulse varied from 70 to 76; the skin became somewhat cooler.

Warm bath; quarter of house-allowance.

28th. Further increase of appetite, the quarter of the house-allowance ceased to satisfy the patient; two or three stools daily; abdomen free from pain, even under pressure; he complained of nothing but weakness.

August 10th. Said he was better than usual; abdomen still free from pain and sonorous in every direction, except in the epigastrium, where percussion produces no sound; two or three stools daily; appetite continues good; no nausea nor vomiting; pulse 88, small and weak; precordial region and the corresponding region in the back furnish but little sound under percussion;

respiratory murmur feeble, where the sound is dull; cough and expectoration very slight.

Rice ptisan, quarter of house-allowance.

Until the 29th, the patient's condition remained stationary; epigastric pain since yesterday; pulse small and weak; he got up every day, and, as the other patients affirmed, had food brought him by friends.

30th. Face paler; features more haggard-looking than the previous day: six stools within the last twenty-four hours.

September 5th. Two stools yesterday.

One eighth of house-allowance.

11th. Vomited some of his food taken in the evening; declares that he has not any food brought in by his friends; three stools daily; auscultation and percussion of the precordial region as before; pulse moderately frequent; no remarkable heat of skin.

During the eight following days the diarrhœa and feebleness increased to such a degree, that he only left his bed for the purpose of passing his motions, which were from eight to ten in number daily; he eat a little soup or bread; did not cough, or did so very rarely, and was never heard to complain of pain in the abdomen. He expired on the 26th, at 4 o'clock, a.m., without a struggle, having received the sacrament a few days before, in consequence of the rapid failure of his strength.

Sectio Cadaveris; *twenty-four hours after death.*

External appearances. Last stage of marasmus.

Head. One tablespoonful of serosity in the great cavity of the arachnoid; two in the left lateral ventricle, one in the right; the arachnoid lining the latter was thickened. The entire surface of these ventricles was somewhat softened, as well as the septum lucidum. Brain and cerebellum somewhat less firm than natural. Nothing else remarkable.

Neck. One of the cervical glands of the right side enlarged, and transformed into gray, semi-transparent, or tuberculous matter. Larynx, trachea, and epiglottis natural; the larger bronchi slightly red, otherwise healthy.

Chest. About ten ounces [300 grammes] of clear serosity in the pericardium, and a considerable quantity of clotted blood in the cavities of the heart and large vessels. Heart rather small.—*Left* lung adherent to the costal pleura by means of

pseudo-membrane, the two laminæ of which, united superiorly, were separated inferiorly by a moderate quantity of reddish serosity. This pseudo-membrane, about one line [2 millimeters] thick on the costal pleura and a little less on the pulmonary pleura, was almost completely transformed into tuberculous matter, in the form of distinct granulations placed more or less closely to each other. In some places, however, the transformation was complete and continuous, and in the situation corresponding to that of the dull sound during life, there was found between the pleuræ a tuberculous mass, from nine to fourteen lines [2 to 3 centimeters] thick, and of the breadth of the hand. The lung on this side was healthy, with the exception of a few tuberculous or semi-transparent granulations at the apex.—The *right* lung was connected by general close cellular adhesions with the costal pleura, more particularly thick along the diaphragm. On the attached surface of the costal pleura appeared numerous tuberculous granulations, from apex to base, increasing in size and number from above downwards, so that near the diaphragm they formed a continuous mass. Granulations of the same kind, but of less size, and fewer in number, existed under the pulmonary pleura. The upper lobe of the lung presented nodules, varying in size from that of a filbert to that of a walnut, formed of tuberculous masses, streaked with grayish lines, softened or unsoftened, and surrounded by a small quantity of reddish and grayish substance, which yielded, on pressure, a small quantity of thin fluid: pulmonary parenchyma perfectly healthy. The middle lobe also exhibited some nodules, like those just described, and the lower lobe some granulations only.

Abdomen. Abdomen sunken; its anterior parietes adherent to the small intestines, the convolutions of which were bound to each other by cellular bands, varying in length from one inch and two lines to two inches and four lines [3 to 6 centimeters], most commonly the latter; these bands were at some distance from each other, and between them appeared, from place to place, small elongated cysts, containing a little reddish serosity, and adhering to the convolutions of the intestine. Under the intestinal peritoneum appeared tubercles varying in size from that of a hemp-seed to that of a pea, and larger the nearer they were seated to the mesentery. These tubercles, which were from two and a half to three lines [5 to 6 milli-

meters] distant from each other, and rarely confluent, were marked with black lines or dots; when so confluent, the knuckles of intestine were very closely united in the corresponding places. In the interspaces the peritoneum was of blackish colour. It was impossible to remove a single one of these tubercles without at the same time carrying away a portion of mucous membrane; this membrane was perfectly free from ulceration. Similar granulations were found under the peritoneum investing the bladder and the left side of the lumbar division of the spinal column.—Great omentum slightly vascular on the right side, over a surface as broad as the hand, nearly an inch and two lines [3 centimeters] thick in its central part, reached as far downwards as the fallopian tube, in which situation it had become adherent and transformed into tuberculous matter, either deposited in masses or in granulations. The mesentery appeared equally thick, and had undergone the same transformation. The gastro-hepatic omentum presented the same condition, and as it was not more than half an inch [$1\frac{1}{2}$ centimeters] in length, the stomach had become, as it were, agglutinated to the liver.—The latter organ adhered closely to the diaphragm by means of pseudo-membrane, consisting of two laminæ, and almost completely tuberculized, thicker near the free border of the middle lobe than elsewhere, and one line [2 millimeters] thick in the narrowest places.—Spleen invested with pseudo-membrane, similar in character, but much less closely adherent to the subjacent parts.—The liver was besides soft, much more easily broken up than natural, of deep red colour, and contained in its interior ten small yellowish miliary tumours, of tuberculous appearance. Two small tumours of similar kind existed in the interior of the spleen, which organ was not otherwise remarkable.—Stomach small, and, as it were, encased in the midst of the parts surrounding it. Mucous membrane red in the fundus and to the right of the cardia, over a surface measuring two inches and four lines [6 centimeters] in length; grayish elsewhere; very much softened, except the three inches and seven lines [9 centimeters] next the pylorus, where strips of from one to three lines [2 to 6 millimeters] in length were obtainable. Mucous membrane of the small intestine natural in respect of consistence, colour, and thickness. That of the upper half of the colon of dirty white

colour, and as soft as mucus: lower down a few red-coloured ulcerations.—Other abdominal viscera natural.

The first symptoms of the affection which proved fatal to this patient did not supervene till four months before his admission, and about six and a half before death. At first slight cough appeared, soon followed by expectoration in moderate quantity; two months later the patient began to suffer from general abdominal pain, increased by pressure, not severe, though sufficiently so to lead the practitioner who saw the case to draw blood from the arm. On the patient's admission this pain still existed, was increased by pressure and movement of the body; the abdomen was generally elastic, even above the umbilicus; the appetite moderate; there had been neither nausea nor vomiting; the local thoracic symptoms were but slightly marked; the pulse tranquil; —so that, on the whole, first consideration, based on superficial examination, would have led to the idea that the existing malady was one of slight consequence. Soon afterwards, however, an increase in the number of stools took place, at the same time that the abdominal pain ceased for good; the patient experienced some nausea occasionally, but the appetite increased, and continued excellent for five weeks. However, notwithstanding the persistence of appetite, and a sufficient supply of food, the patient's strength rapidly failed, and he died without the supervention of any new phenomena, without a struggle, and as if from complete exhaustion of vital power. Among other appearances the post-mortem examination disclosed a few tubercles in the lungs, a greater number under the pleura, especially the costal lamina; tuberculized pseudo-membrane in the left pleura, and more especially among the abdominal viscera, coupled with loose cellular adhesions; and lastly, tubercles on the attached surface of the intestinal peritoneum, together with transformation of almost all the folds of the mesentery into tubercles.

The abdominal symptoms experienced by the patient before and after his admission were those of chronic peritonitis; and no doubt could be entertained during life of the existence of that affection. On the other hand, the anatomical characters of chronic inflammation of the peritoneum were completely established; so that there was an evident connexion between the symptoms and the alterations of structure, and the former and the latter stood

to each other in the relation of cause and effect. It is, however, worthy of remark, that the anatomical changes in the peritoneum were not all of the same date. Some of them, the pseudo-membrane investing the liver and spleen, were, without doubt, rather recent; whereas the filamentous bands binding the convolutions of the intestine together had evidently been produced at an earlier period, but not before the outset of the tuberculous affection of the lung,—for, on the one hand, the patient had enjoyed uninterrupted good health for the six years preceding the commencement of cough, and, on the other, experience proves that pseudo-membranes may readily become organized within a period not exceeding four months.

It is particularly worthy of note that the morbid changes in the abdomen were much more extensive and advanced than those of the tissues of the lung; and that the general symptoms, especially febrile reaction, were of but slight intensity,—a circumstance according perfectly with the chronic character of the malady.

The cause of the peritoneal inflammation is a question of much interest. If tubercles, or gray semi-transparent granulations had been found underneath all the pseudo-membranes, or cellular adhesions of the abdomen, the development of the latter might have been ascribed to the influence of those bodies. But this was far from being the case; no doubt there were numerous tubercles under the peritoneum of the small intestine, but these bodies were very few in number, and deeply placed in the substance of the liver and spleen, and yet these organs were invested with thick pseudo-membranes. This supposition must consequently be renounced; and as it would follow, from the facts which have fallen under my observation, that chronic peritonitis is proper to tuberculous subjects, we cannot imagine that the febrile action, so common in a multitude of diseases, played anything of an important part in the development of the affection we are considering. Hence we are constrained to admit, as the mainspring in producing the affection, the action of a general cause, which acts in an unknown manner, and in one case gives rise to chronic inflammation of the peritoneum—in others of the pleuræ, &c.

Lastly, I shall draw the reader's attention to the circumstance of the rapidity with which pseudo-membranes may undergo the

tuberculous transformation. It is, in truth, obvious that the tuberculous matter developed in the pseudo-membrane, in masses or granulations, must be produced after these; and such matter is found in individuals cut off after forty days' illness.

The following case, remarkable as it is in more than one point of view, corroborates the last statement, while it proves that the most serious and extensive morbid changes of the peritoneum may remain almost latent.

Case XVIII.[1] The subject of this case was a shawl-worker, aged 45, of middle height, with light-coloured eyes, chesnut hair, now growing gray, admitted into the Hospital Beaujon on the 4th of June, 1840.

During the four or five years preceding this period, the patient vomited a certain quantity of bile every second or third day, on rising from bed, when he put his feet to the ground, and never under any other circumstances; this vomiting took place almost without any effort on his part. No other disorder of the digestive functions existed; and, during the period in question, he even gained a little flesh. At the beginning of May, being in other respects in good health, when going to take a warm bath (which he was in the habit of doing every week) he felt a distressing sensation in the region of the liver, which he compared to that of hard stones knocking against each other; this was not preceded, accompanied, nor followed by any other kind of pain in the abdomen. Two or three days after, finding himself uncomfortably pressed by his clothes, the patient examined his abdomen, and found it, as it appeared to him, enlarged; its size continued further to increase until his admission, and the enlargement was very shortly followed by diarrhœa (three or four stools daily), a considerable failure of appetite and strength, habitual sensation of fatigue, dry cough, and sometimes slight fever. He gave up his ordinary work for the fifteen days preceding his admission, and remained at home, partly in bed, partly sitting up.

Between the 3d and 5th of June, in consequences of fulness of the pulse, coupled with the notions entertained of the nature of the affection, leeches were applied twice to the anus,—the

[1] Reported by M. Cossy, Member of the Medical Society of Observation, and one of the most distinguished "Internes" of the Parisian hospitals.

first time twenty-five, the second thirty; and on the 6th of June, eight ounces [250 grammes] of blood were taken from the arm.

June 8th. *Present state.* Decumbency horizontal; face natural, but rather pale; intelligence tolerably quick; correct in his answers; tongue tolerably clean, somewhat moist; anorexia; slight thirst; neither nausea nor vomiting for several days past; four liquid stools, each small in quantity, (without colic pains,) during the last twenty-four hours; abdomen very full, free from pain even under pressure, dull-sounding, except near the umbilicus, where percussion furnished a humoric sound; manifest fluctuation lower down; urine in considerable quantity, of yellow colour, alkaline, and passed without pain; he coughs but seldom and does not spit; percussion and auscultation of the chest give natural results; pulse 84, regular, rather full; skin hot and dry; has never had piles nor jaundice.

Solution of syrup of gum; two pills, containing each three quarters of a grain [5 *centigrammes*] *of digitalis in powder; two broths.*

In the evening the patient was rather restless and hot; the pulse had risen to 112; and this state continued the 9th, 10th, and 11th, without rigors, the diarrhœa still persisting.

12th. Abdomen appears somewhat smaller than usual, still free from pain; four stools daily. Respiratory murmur rather harsh; expiration somewhat hard, and prolonged at the apex of the left lung; posteriorly in this region some bubbles of crackling rhonchus were audible in inspiration; pulse 90; skin hot, without being moist; weakness on the increase.

Rice; syrup of gum acidulated with lemon-juice; 2 digitalis pills; broth.

15th. Diarrhœa increased; pulse 100 in the morning, 120 in the evening; skin hot; coughs seldom; auscultation and percussion give the same results as on the 12th.

17th. Weakness still further increased, the patient can scarcely raise himself to the sitting posture; six stools during the night; size of the abdomen as before; auscultatory phenomena more strongly marked than on the 12th; respiratory murmur harsher, and expiration somewhat more marked under the left clavicle; pulse 90, regular; skin hot and somewhat moist.

Rice-water; four ounces [120 *grammes*] *of white decoction;*

small linseed enema, with ten drops of Sydenham's laudanum; gum potion; half a grain [0·03 *gramme*] *of hydrochlorate of morphia; two broths.*

20th. Still further increase of weakness; the patient felt that he was daily growing worse. In the lower half of the posterior surface of the right side, dull sound, slight bronchophony without œgophony, and complete absence of respiratory murmur; higher up some soft crackling rhonchus; on the left side posteriorly crackling rhonchus from base to apex. No pain either on the left or the right side of the chest. Pulse, as before, 90; skin hot and moist; abdomen as usual; tongue red and dry, rather thick, and put out only partially.

To be cupped to four ounces [120 *grammes*] *under the right nipple.*

On the night of the 21st there was slight delirium; on the 22d, in the morning, the intellectual faculties were perfectly clear, the patient could not raise himself to the sitting posture; pulse 96; skin hot and moist; complete anorexia; diarrhœa as before; results of percussion very much the same as on the 20th; bronchial respiration in the lower and posterior third of the right side, with marked bronchophony without œgophony; some crackling rhonchus at both apices.

23d. Pulse 108; oppression of breathing increased.

V.S. to four ounces [120 *grammes*]; *opiate preparations as before.*

24th. The blood drawn yesterday is covered with a greenish, gelatiniform buff; one stool only; the rest as usual.

25th. Decomposition of the features; three stools.

26th. Decomposition of the features more obvious than before; restless night with talkative dreams; tongue grayish, clammy, only partially protruded; abdomen still free from pain, even under pressure, and of ordinary size; stools liquid, and partly involuntary; results of percussion and auscultation as before, with some bubbles of sub-crepitant rhonchus in the right mammary region; pulse 112, small, weak, regular; skin hot and bathed in perspiration. In the evening the patient fell into a sort of comatose state, after having been delirious part of the day; and he expired the following day at noon.

Sectio Cadaveris; *forty-six hours after death.*

External appearances. Cadaveric rigidity strongly marked;

slight greenish blue discoloration of the abdomen, the size of which is not changed.

Head. Very strong adhesions between the skull and dura mater, which appears covered with blood after its separation from the bones. General sub-arachnoid infiltration; rather marked capillary injection of the pia mater. Two spoonfuls of clear serosity in each of the lateral ventricles, the walls of which are perfectly healthy; no traces of yellow or gray semi-transparent granulations in the fissures of Sylvius or elsewhere; the entire encephalic mass perfectly healthy.

Chest. About ten ounces [300 grammes] of clear non-flocculent serosity on the right side, without a trace of pseudo-membrane on the pleuræ. Underneath or on the attached surface of the costal pleura are miliary, semi-transparent granulations; in the upper regions these are from half to one line [1 to 2 millimeters] in diameter, placed at distances of from one to three lines [2 to 6 millimeters] from each other; in the diaphragmatic region they were much more numerous, and nearly half of them were yellow and tuberculous. The lung was perfectly free from adhesions, and slightly engorged posteriorly and inferiorly; at its apex were twelve tubercles, varying in size from that of a pin's head to that of a hemp-seed, and two inches [5 centimeters] lower down, a tubercle, the size of a haricot-bean, of yellowish and whitish colour, creaking under the scalpel, and exhibiting all the characters of a cretaceous tubercle. The lower lobe is of brownish red colour, tolerably firm and non-granular.—*Left* lung generally adherent; the adhesions are readily torn; it was somewhat less heavy than the right, contained about fifty whitish tubercles at the apex, measuring from one to two and a half lines [2 to 5 millimeters] in diameter; among them appeared some dilated bronchi, one of which terminated in a *cul-de-sac*, three lines [6 millimeters] below the apex. Lower lobe engorged.—Three tablespoonfuls of clear serosity in the pericardium. Heart of good size, pale, very flaccid, and easily torn. Walls of ordinary thickness; the ventricles contain a certain quantity of fluid blood, giving off some bubbles of air, and some small yellowish coagula; ventricular valves and orifices healthy.

Abdomen. From about thirteen pints seven tenths to seventeen pints [8 to 10 litres] of serosity in the cavity of the ab-

domen, holding in suspension irregular, gelatiniform, yellowish and greenish, transparent flocculi, which might have been taken for masses of cellular tissue infiltrated with fluid, but which passed into the liquid form when an attempt was made to collect them in the hand. The entire surface of the peritoneum, as far as visible, covered with an innumerable quantity of round, whitish, opaque, granulations, measuring from half to one line [1 to 2 millimeters] in diameter, closely set beside each other, confluent in some places, discrete in others. These granulations were developed in the midst of a reddish, semi-transparent pseudo-membrane, which could be removed from them, while they remained still adherent to the peritoneum. The pseudo-membrane in question was only half a line [1 millimeter] thick at the lower part of the abdomen, and grew gradually thicker as it reached the umbilicus, where it measured a line and a half [3 millimeters]. There it divided into two laminæ, one of which continued upwards, investing the parietal peritoneum and the great omentum,—while the other passed backwards, likewise investing the omentum in this direction, the length of which was reduced to from three and a half to four inches [9 to 10 centimeters]. Its free or lower border was thin; its adherent or upper one inch and two lines [3 centimeters] thick; and this fold of the peritoneum, like the gastro-hepatic omentum, the transverse meso-colon, the left and right lumbar meso-colon, and the mesentery, was transformed into a yellowish mass, of pink tinge in some places, hard, friable, lardaceous, as it were, in some spots, and exhibiting on its surface, as in its substance also, a number of separate tuberculous granulations. The great omentum contained some good-sized venous trunks, filled with black blood.—Stomach free from adhesions before and behind where it exhibits small granulations, few in number; along both curvatures these bodies are both numerous and of tolerable size. Mucous tunic natural.—Small intestine forms a sort of globular, pedunculated-like mass, floating freely in the cavity of the abdomen; the convolutions adhere to each other by whitish, very friable pseudo-membrane, easily removable, and exhibiting no trace of organization. In these places the intestine presents marked injection of the striated or punctiform varieties, and a great number of granulations; whereas elsewhere, where the intestine is free, it is pale-coloured, without a trace of pseudo-membrane, and pre-

sents whitish, opaque, glossy granulations, confluent in some spots. Mucous membrane, with the exception of slight vascularity, healthy.—The large intestine exhibited, internally, the same changes of structure as the small; its mucous membrane, with the exception of some red discolorations in patches, and unusual development of crypts, was in the natural state.—Liver slightly yellowish and brownish, easily torn, fatty; on the convex surface, and to the left of the suspensory ligament, there are gray semi-transparent granulations, which increase in abundance the nearer the ligament they are examined; no pseudo-membrane. On the right of the ligament the liver adhered, on the contrary, by a pseudo-membrane formed of a double lamina, to the diaphragm, and there were besides a great number of granulations springing from the peritoneum. The inferior surface was perfectly smooth, and free from tubercles, except in the sulci.—Nothing remarkable in the other abdominal viscera.

Hence, then, the outset of the disease was marked by simultaneous occurrence of dry cough, increase of size of the abdomen, which continued free from pain; watery diarrhœa; and failure of appetite and strength, obliging the patient to give up his ordinary work. Fifteen days later, the same symptoms continuing, the patient began to keep his room, sometimes his bed; and, after somewhat less than a month's illness, he was brought in a carriage to the Hospital Beaujon, and bled more than once on the days following his admission, without obvious change in his condition. Examined carefully on the 8th of June, about a month after the appearance of the first symptoms, the abdomen was found of large size, and the seat of manifest fluctuation; the cough was ascertained not to be frequent; percussion and auscultation disclosed nothing remarkable in the state of the chest; the appetite and strength were found to have suffered very materially; the pulse was tranquil. These phenomena continued, and grew more marked; the weakness and diarrhœa increased, while the appetite improved. Soon after the existence of pulmonary tubercles became apparent, by means of auscultation, on the right and left sides; effusion took place into the right side of the chest; the diarrhœa continued; and the patient expired, comparatively speaking calmly, on the 27th of June, less than two months after the supervention of the earliest

symptoms, and without having experienced any abdominal pain. At the post-mortem examination some slight alterations were found in the lungs,—advanced and extensive changes in the peritoneum and its various processes, such as tubercles, and gray semi-transparent granulations adhering to its free surface, with or without coexisting pseudo-membranes, &c.

The last circumstance deserves to be particularly remarked: in every place where there were only gray semi-transparent granulations, no pseudo-membranes had formed, and wherever these existed, tubercles were found. This shows, on the one hand, that tubercles are developed in pursuance of the same laws on the surface of the peritoneum, and in the pulmonary parenchyma, that in both they commence under the form of the gray semi-transparent granulation; and, on the other hand, that in a certain number of cases the development of pseudo-membrane occurs subsequently to that of gray semi-transparent granulations, for in the present case there was none of the former product visible wherever the tuberculous disease was limited to the gray semi-transparent granulation.

Nor can I avoid drawing the reader's attention to another remarkable circumstance in this case, I mean the tranquillity of the patient, and the comparative mildness of the symptoms he suffered under, in spite of the progress of the affection being so rapid as to cut him off in two months. At no period of the disease, in truth, did abdominal pain exist; the febrile action never rose very high; the diarrhœa, although of protracted duration, was less considerable than in many cases in which the malady runs a chronic course;—and yet observe the quantity of pseudo-membrane and tubercle in the abdomen, and the extensive transformation of the folds of the peritoneum. The amount of tuberculous deposition on the attached surface of the pleuræ was equally remarkable. The principal and most striking symptom was weakness; for after fifteen days of apparently slight illness, the patient was obliged to keep his room, frequently even his bed. The extent of the peritoneal changes and the fact of their having set in from the first, oblige us to regard them as the main cause of this debility, and to ascribe to them, in great measure at least, the emaciation of the patient, as a result of the disturbance which they must have caused in the process of digestion.[1]

[1] See Part I, pp. 131 et seq.

Nevertheless, in spite of the small number of abdominal symptoms observed, the diagnosis of peritonitis did not long continue matter of uncertainty. On the one hand, before either cough had set in, or the abdomen had enlarged, the patient was in good health, and had experienced no symptom justifying the notion of the existence of organic disease of the liver or any other abdominal viscus; the state of the urine excluded the idea of renal disease, and diseases of the heart, sufficiently advanced to produce effusion into the abdomen, commence by causing infiltration of the cellular tissue. On the other hand, accumulation of a certain quantity of serosity in the abdomen is sometimes one of the first symptoms of chronic peritonitis. The few bubbles of crackling rhonchus heard at the apices of the lungs, a few days after the patient's admission, indicated the existence of tubercles in those organs; from this moment no doubt respecting the nature of the case could be entertained, nor did any circumstance occur subsequently, justifying a modification of the diagnosis.

The following case, furnishing, as it does, an additional example of the serious character of chronic peritonitis, and of its ill influence on the course of the phthisical disease itself, will afford new evidence of the importance of its deep study.

Case XIX. A female cook, aged 30, of middle height, with ill-developed osseous system, and chesnut hair, was admitted into the Hospital Beaujon, on the 20th of November, 1839, having been, at that period, six months ill. The patient declared that during these six months she had neither coughed nor spit, had neither pain in the chest, nausea, vomiting, nor diarrhœa; she had simply suffered from failure of appetite, and had lost flesh during the last three of those months. On her admission there was considerable emaciation; the sound of the chest was natural, but there were a few bubbles of crackling rhonchus audible at the apex of the right lung posteriorly: neither cough, enlargement of the abdomen, abdominal tumour, nor diarrhœa existed.

Fifteen days later, the abdomen of the patient had enlarged considerably, and had become the seat of manifest fluctuation, but was free from pain, or very slightly painful, even under pressure; no induration was discoverable anywhere.

Subsequently the enlargement of the abdomen gradually disappeared, and abundant diarrhœa supervened.

February 10th, and following days. Vomiting of greenish, bitter-tasting matters.

20th (the day on which the state of the patient began to be noted daily). The vomiting continues; the outlines of the convolutions of the bowel are visible on the surface of the abdomen, the size and form of which are very closely the same as natural; no fluctuation discoverable. No cough; scarcely any unusual heat of skin; pulse of natural frequency; extreme emaciation; expression of face tranquil; she states that she has no suffering in any part of the body.

Solution of syrup of gum; small linseed enema, with four drops of laudanum; three broths.

22d. Abdomen still free from pain; the patient declares that when enlarged it was not the seat of any pain; form of the intestines still visible on the surface, somewhat more on the right than the left side; epigastrium and hypogastrium somewhat prominent, elastic, tense, without appreciable tumour, sonorous; urine and stools abundant and involuntary; vomiting once during the night, not excited by cough; she states that until this occasion vomiting had occurred only in the evening, and invariably after she had taken a little broth; tongue scarcely moist; appetite completely gone; skin dry; heat of skin moderate; pulse 96, regular; percussion-sound somewhat less clear under the left than the right clavicle; respiratory murmur rather harsh, with some prolongation of expiration under the latter bone, though not decidedly bronchial.

In the evening abundant vomiting of bitter matters; stools liquid and involuntary.

24th. Much the same as before; the patient does not recollect having vomited the day before.

She died the next day, at 1 o'clock, a.m.

Sectio Cadaveris; *thirty-three hours after death.*

External appearances. Last stage of marasmus; slight blackish tint of the abdomen.

Head. Pia mater but slightly injected, not carrying with it, when removed in shreds, any portion of cortical substance; it exhibits no trace of gray semi-transparent granulations or tubercles. One tablespoonful and a half of clear, transparent

serosity in each of the lateral ventricles, which were otherwise perfectly healthy, like the entire mass of the encephalon.

Neck. Larynx small and natural.

Chest. General cellular adhesions of both lungs; their upper lobe soft and light, the lower heavy and generally moist, granular-looking under a lens in a considerable number of places. The right upper lobe presented two tubercles of yellowish gray colour and of the size of a millet-seed; the same portion of the left organ contained six similar tubercles, of somewhat larger size; four of these were grouped together, and rather difficult to break up under the fingers.—The pericardium contained two tablespoonfuls of serosity; heart of small size; its walls perfectly healthy; a moderate quantity of semi-liquid blood in its cavities.

Abdomen. The parietal peritoneum adhered more or less closely to the convolutions of the small intestine; both were invested with pseudo-membrane, tuberculized in several places. The deeply-seated parts of the small intestine were agglutinated together by pseudo-membrane, generally speaking by imperfectly-formed cellular tissue and tuberculous matter, which existed there in great abundance. The stomach, exhibiting a considerable quantity of tuberculous matter on its free surface, adhered to the liver by means of pseudo-membrane like that already described. The gastro-hepatic omentum was infiltrated with tuberculous matter, and the mesentery contained tubercles in abundance. The stomach was of small size, and contained a little yellowish matter; the mucous tunic, much softened, almost pultaceous, exhibited very much its natural colour.—Mucous membrane of the small intestine natural; the bowel contains liquid greenish matter in abundance.—Upper half of the mucous membrane of the large intestine whitish-coloured; lower half of more or less bright red, occurring in patches or uniformly; softened to pulpiness throughout.—Liver somewhat larger than usual, not very moist, pale-coloured, without being obviously fatty.—Spleen in no respect remarkable. Kidneys pale, but healthy.—Neck of the uterus, more especially its posterior lip, slightly swollen.—The rest natural.

It is no doubt matter for regret that the patient was not examined with greater care at the period of her admission, and that full notes of her state were not daily taken. It is, how-

ever, unquestionable, that at that time she exhibited none but general symptoms, (with the exception of a little crackling rhonchus at the upper part of the chest,) namely, considerable emaciation, without diarrhœa, or apparent alteration of the form or size of the abdomen. It was not until fifteen days later that the abdomen appeared enlarged, and the seat of manifest fluctuation, still without or almost without pain. After a lapse of time, the duration of which was not made out with precision, the size of the abdomen began to decrease; on the 10th of February, greenish bitter vomiting supervened, and on the 21st of the same month, four days before death, the intellectual faculties of the patient were in the natural state, her abdomen was of the usual size, very elastic, and free from pain, and exhibited on its surface the outline of the convolutions of the intestine. This condition of the abdomen, taken in connexion with the previous existence of fluctuation, left no room for doubt as to the existence of chronic peritonitis; for it is a peculiarity of this malady, as of chronic pleurisy, when at all extensive, to entail the exhalation of a certain quantity of serosity in the majority of phthisical cases. After a variable lapse of time this serosity is absorbed; and as the convolutions of the intestine then adhere to each other, or to the walls of the abdomen, sometimes to both, the circulation of the contents of the intestine is necessarily obstructed, and as a necessary result more or less marked dilatation of those convolutions follows, they become prominent on the surface of the abdomen, and cause unnatural sonorousness of the cavity generally. In the present as in the preceding case, it is to be further observed, the diagnosis of peritonitis being once established, that of the tuberculous affection of the lungs became matter of greater certainty;—for chronic peritonitis is tuberculous in nature, and tubercles do not form in any organ, in subjects aged upwards of fifteen, unless they at the same time exist in the lungs.

As in the preceding case, the pulmonary alterations were but slight; and the prostration of the patient must be chiefly referred to the extensive anatomical changes in the peritoneum.

The period of development of the peritonitis is a point well deserving inquiry. If we consider, first, that the few tubercles in the apices of the lungs were incapable of satisfactorily accounting for the general symptoms; secondly, that the loss of appetite and emaciation, existing at the period of the patient's

admission, could not be attributed to an affection of the gastro-intestinal mucous membrane, for of such affection no sign existed; and, thirdly, that the engorged state of the uterus (admitting it, in the teeth of all probability, to have been considerable at that time) could not account for the wasting away of the patient;—if we consider all these things, I say, we shall be inevitably led to the conclusion that the peritonitis commenced at the same time as, and was the true cause of, the first symptoms. And we are justified in concluding, generally, that in a certain number of cases, and under circumstances hitherto undetermined, the effects of chronic peritonitis may be at first limited to this alteration of nutrition, and that the disease may give rise, consecutively, to extreme weakness and emaciation, before its more characteristic symptoms display themselves. At least, if we refuse to admit these conclusions, we bind ourselves, as it appears to me, to the opinion that the causes of phthisis, whatever they may be, may remain latent for a greater or less length of time, and, nevertheless, produce considerable emaciation; now this I believe to be an impossibility.

There is no necessity for a greater number of cases than those already related, to render the means of diagnosticating chronic peritonitis obvious. The existence of the affection might be regarded as matter of certainty in any individual, who had within a variable space of time, and in the order in which they are mentioned, experienced the following symptoms:

1st. Abdominal pain, commonly general and not severe, though very troublesome, without diarrhœa.

2d. Increase of size, and of sonorousness of the abdomen, which soon after becomes the seat of obvious fluctuation; in cases where there neither exists, nor has existed, any symptom of organic disease of the abdominal viscera, of the liver more especially, of the kidneys, or of the heart.

3d. The more or less rapid disappearance of the effusion, after which the abdomen, slightly and generally tympanitic, exhibits on its surface the outlines of the intestines, distended, in consequence of the difficulty with which the matters circulating through them make their way onwards.

And all this is accompanied with weakness, which is not explicable by the state of the lungs, nor by that of the excretions, which are not by any means unnaturally abundant.

SECTION XII.—SYMPTOMS OF ULCERATIONS OF THE EPIGLOTTIS, LARYNX, AND TRACHEA.

§ 1. *Symptoms of Ulcerations of the Epiglottis.*

Of eighteen cases of this kind which fell under my observation, six were furnished by individuals free from ulceration in the larynx and trachea. Four of them complained of more or less severe pain at the upper part of the thyroid cartilage, or between that cartilage and the os hyoides. The pain was compared to that of a wound, to pricking pain, or spoken of as distressing heat; it came on one or two months, or a few days only, before death. In three of these cases deglutition was obstructed, although the pharynx and tonsils were in the natural state; when the patients attempted to swallow fluids, these even sometimes gushed out through the nose. Of the twelve other patients who had at once ulcerations of the epiglottis, in the larynx and in the trachea, four swallowed with difficulty, and complained of pain in the place mentioned. In one only of the number did fluids partly return by the nostrils, when an attempt was made to swallow them.

Thus we are led to the conclusion that ulcerations of the epiglottis are signified symptomatically by fixed pain at the upper part of, or immediately above the thyroid cartilage, difficulty of swallowing, and escape of fluids by the nostrils,—the pharynx, and tonsils being meanwhile perfectly sound. The phenomena observed in cases of ulceration of the larynx go to confirm what has been said on those of the epiglottis; for in the former, so long as the epiglottis and pharynx remain unaffected, neither escape of fluids through the nose nor obstruction of deglutition is noticed. Possibly, in cases where the peculiar symptoms of laryngeal ulcerations are absent, fixed pain at the upper part of the thyroid cartilage would in itself suffice to indicate those of the epiglottis; at least this is rendered presumable by the case next related, in which pain was the most remarkable of the symptoms in question.

The cases I have observed within the last fifteen years show

that the symptoms just enumerated are, in truth, those of ulceration or destruction of the epiglottis. They are also those of essential inflammation of that organ,—a rare species of inflammation (I have observed it six times nevertheless) which cannot exist without the functions of the epiglottis being more or less obstructed. I may observe too that the symptoms in question are in perfect harmony with what might have been anticipated from the results of M. Longet's experiments upon the mechanism of the functions of the epiglottis.

Case XX. A tailor, aged 40, not of strong constitution, born of parents who died in advanced years, was admitted into the Hospital of La Charité on the 18th of October, 1824. He had never suffered but from slight indisposition, was not subject to colds, had been ill fifteen months, during the entire of which period he had had cough. The cough continued dry for the first two months, was thenceforth accompanied with expectoration and shortly after with dyspnœa. Tolerably sharp pain had occurred, about three months after the outset, in one side of the chest, had lasted fifteen days, and had subsequently twice returned, lasting on each occasion, however, a less time than on the first. For the last two weeks he had suffered from slight sore throat, hoarseness, and difficulty in swallowing; perspiration had only occurred from time to time, and there had been no rigors. The appetite had gradually failed; there had been almost uninterrupted diarrhœa for the last six months, occasionally accompanied with colic pains, which had been more severe during the first eight weeks of its occurrence than at any later period. The emaciation and failure of strength became perceptible as soon as he began to spit. He had ceased to work for six months and kept his bed for two.

October 19th. *Present state.* Face pale and emaciated; pain, prodding sensations and dryness at the upper part of the thyroid cartilage; slight difficulty in swallowing, although the pharynx and tonsils are in the natural state; nothing particular in the trachea; cough pretty frequent; sputa small in quantity, not completely opaque; chest gives little sound under either clavicle, especially the right, on which side the dullness extends over a space corresponding to almost the entire of the upper lobe; tracheal respiration; resonance of the voice, without

pectoriloquy in the same places, more marked under the right than the left clavicle; pulse 90; great chilliness: appetite very much diminished; thirst slight; epigastrium free from pain; six liquid stools during the last twenty-four hours, almost without pain.

Rice ptisan, with syrup of quinces; diascordium, with three quarters of a grain [5 *centigrammes*] *of opium; three rice-creams.*

The following days the sputa became perfectly opaque and dirty coloured; the pain in the throat continued to the same amount, or thereabouts; complete anorexia soon set in.

November 7th. The diarrhœa had now increased greatly; the tongue was still natural; the pain at the top of the thyroid cartilage as before; deglutition of the saliva accomplished with great difficulty; the voice unchanged; no disagreeable sensation along the trachea; the pulse slightly more frequent than natural.

8th and 9th. No appreciable change.—10th, at 5 a.m. the patient lost consciousness, and in the morning was found lying on the right side, with the pupils much contracted; the eyes half open; respiration hurried; the pulse slow; no movement unless when some part of the body had been lifted from its place by a bystander, and then it is made very feebly; consciousness not returned. He expired at noon without any change having occurred.

Sectio Cadaveris; *twenty-two hours after death.*

External appearances. Last stage of marasmus; nothing else remarkable.

Head. Three small spoonfuls of reddish and slightly turbid serosity in the upper part of the cavity of the arachnoid. Some specks of blood on the internal surface of the dura mater, easily removable, and not connected by pseudo-membrane. Tolerably abundant sub-arachnoid infiltration; half a tablespoonful of serosity in each lateral ventricle; somewhat more in the lower occipital fossæ. Brain slightly softened and injected with blood.

Neck. Œdema of the glottis, raising the surface of the mucous membrane to the height of a line and a half [3 millimeters] in the neighbourhood of the arytenoid cartilages, much less elsewhere. Mucous membrane of the epiglottis

more or less red; exhibits some ulcerations on its lingual surface; inferior surface of the same colour and an unusual shining aspect, also the seat of ulcerations of variable depth; the fibro-cartilaginous tissue was laid bare at the bottom of one of these, its upper part on the right side completely destroyed to a superficial extent of two lines [4 millimeters].—Larynx natural; mucous membrane of lower part of the trachea red.

Chest. Some cellular adhesions at the upper and posterior part of the *left* lung. Semi-cartilaginous pseudo-membrane investing the entire periphery of the upper part of the *right* lung and uniting it to the surrounding parts; elsewhere this lung adheres by means of tolerably close cellular membrane. At the apex of the upper lobe of the *right* lung a large anfractuous cavity, as large as the fist of the individual, filled in great part with a red turbid fluid, crossed by bands of slight thickness, and lined with shreds of softish pseudo-membrane. The walls of this cavity scarcely measured two lines [4 millimeters] in thickness posteriorly, were much thicker anteriorly, and formed of grayish and blackish matter more or less hard, and semi-transparent in several places. The remainder of the lobe was firm, transformed into semi-transparent gray matter or tubercles, or filled with small partially evacuated cavities. There was also a little semi-transparent gray matter with some crude tubercles at the upper part of the other two lobes. The changes were of the same kind on the *left* side, but not so extensive.—Right bronchi contained red matter like that in the large cavity; they were redder and thicker at the apex than at the base of the lung.—Heart small; aorta studded with yellowish patches throughout.

Abdomen. About three pints and a half [2 litres] of clear serosity in the cavity of the abdomen.—Stomach contracted; contains a great deal of very tenacious mucus. Mucous membrane thrown into numerous plicæ, generally somewhat red, natural in regard of thickness and consistence.—Small intestine so narrow that the enterotome was with difficulty passed into it; contains a great deal of grayish mucus. With the exception of a few small tuberculous granulations, some of them ulcerated, others not, placed in its lower fourth, either on or in the interspaces between the patches of Peyer, the mucous membrane was healthy.—The large intestine contained a turbid, grayish, disagreeably-smelling liquid. In the twenty inches

[50 centimeters] next the ileo-cæcal valve (with the exception of a zone an inch and two lines [3 centimeters] wide, where the walls were healthy) the muscular membrane was laid bare, of grayish colour, firm consistence, about one line [2 millimeters] thick, and presented here and there shreds of mucous and cellular membrane adherent to its surface. There were, besides, in this intestine four ulcerations, measuring two inches [5 centimeters] in diameter, in which the muscular tunic was also laid bare, and measured half a line [1 millimeter] in thickness. The mucous membrane was generally very pale, and very much softened in the sygmoid flexure of the colon and in the rectum. —The meso-colic glands on the right side were of round form, of the size of a lage pea, grayish and shining, opaque but not tuberculous ; those of the mesentery natural.—Liver natural in size, but harder than usual. Gall-bladder much distended with reddish clear-coloured bile.—Other viscera healthy.

I shall not dwell long upon this case, in which the symptoms and anatomical changes accorded so perfectly. The ulcerations of the epiglottis corresponded exactly in point of seat to the pain experienced by the patient at the top of the thyroid cartilage, and explains the slight difficulty in swallowing ; the tracheal respiration and vocal resonance were proportional to the size of the tuberculous cavities, and the dull sound of the chest opposite the upper lobe of the lungs, denoted the presence of much gray or tuberculous matter, in that situation. The diarrhœa was protracted, and the stools frequent, while the large intestine could not have exhibited more advanced and extensive morbid changes ; and lastly, while the mucous membrane was perfectly healthy, with the exception of a little redness, probably of recent origin, neither nausea, vomiting, nor epigastric pain occurred.

It is worthy of note, that this is the only case in which I found the lingual surface of the epiglottis ulcerated ; or discovered cancerous transformation of the meso-colic glands, in phthisical subjects. I have already noticed this fact in respect of the glands of the mesentery. (Case IV.)

The following case supplies an example of total destruction of the epiglottis, and confirms what has been said relative to the peculiar symptoms of ulceration of this organ.

Case XXI. A gardener, aged 33, of large stature, sanguineo-lymphatic temperament, strong constitution, and well made, was admitted into the Hospital of La Charité on the 6th of September, 1824. Five years before he had had pneumonia (after which, however, he recovered complete freedom of respiration), and, for a still greater length of time, had had an attack of hoarseness every winter. He considered himself a year ill, and had ceased to work for the last six weeks. At the outset he had cough; irregular rigors; clear sputa in small quantity, resembling frothy saliva. The cough had continued; the sputa lost something of their clearness, and became more abundant for the last four months; the patient had always been a chilly person, the slightest fall of temperature causing shivering; he had almost constantly copious night-perspirations, and the general heat of the body had increased within the last six months. During the three months preceding his admission, the voice had been more or less changed in character, the upper part of the larynx had become the seat of pain, varying in acuteness, and, for the last four weeks, he had observed that fluids occasionally returned in part through the nose, when he attempted to swallow them. The appetite had failed from the outset; for some time back digestion had been laborious, and vomiting sometimes came on with the cough. He was free from any distressing sensation in the epigastrium, had no pleuritic pain; there had been no hemoptysis; gradually increasing emaciation existed for the last three months.

September 7th. *Present state.* Face rather pale; moderate degree of weakness; sleep disturbed by the cough; hoarseness, voice excessively cracked; pain between the thyroid cartilage and os hyoides; this pain is constant, pricking, accompanied with heat and dryness, increased by the cough, by speaking, by bending the neck, and by swallowing. The act of swallowing was often laborious, and caused the escape of fluids through the nose; cough frequent, with much oppression of breathing during the night; a small number of opaque, yellowish, and greenish sputa, floating on the surface, or lying at the bottom of a clear abundant fluid. The chest emitted a clear sound on percussion, anteriorly on both sides; pressure under the left clavicle was painful; the expiration tracheal; under the right the respiration appeared only stronger than in the natural state; between

the shoulders bronchial respiration, with strong resonance of the voice; pulse somewhat more frequent than natural; heat of skin natural; tongue and pharynx natural; epigastrium free from pain. One stool, of firm consistence, the previous evening; he complained of nothing but the pain in his throat.

Almond emulsion; gum potion; two rice-creams.

Some slight improvement took place on the following days; on the 17th the pain ceased to be felt, except when he coughed, spoke, or swallowed; nothing remarkable in the sputa; respiration tracheal under the right clavicle, and in the corresponding place posteriorly, with pectoriloquy; appetite small; stools liquid or soft, and few in number.

October 4th. Pain increased, and again become constant; deglutition, especially of solids, excessively distressing; no escape of fluids through the nose; appetite improved.

The appetite continued good for some days, though the symptoms became more strongly marked. On the 12th the patient was unable to swallow anything but fluids, the pharynx and tonsils being, as usual, in the natural state; the appearance of the sputa continued as before; they appeared, sometimes, to be furnished by the larynx; results of auscultation as before; pulse not very frequent; copious night-perspirations; bowels open daily.

Twelve leeches to the neck.

The pain continued, though for some days there was somewhat less heat in the larynx; constant aphonia; sputa greenish and thick. Diarrhœa came on, and continued uninterruptedly from the 15th to the 31st, the day of the patient's death. The appetite failed suddenly; at the same time the epigastrium became tender under pressure, and the patient complained of pulsative pain there. The tongue remained invariably natural.

Sectio Cadaveris; *twenty-nine hours after death.*

External appearance. Commencement of the last stage of marasmus.

Head. Some fissures in the dura mater, through which arachnoid granulations protruded. Pia mater injected, and much more fragile than usual; cerebral substance perfectly healthy. One tablespoonful of serosity in each lateral ventricle.

Neck. The base of the tongue, and the lower parts of the pharynx presented several small ulcerations, generally speaking

placed apart from each other, collected together in numbers in one place only. Epiglottis, lateral ligaments, and upper chordæ vocales completely destroyed; the lower only partly so. The surface, where this destruction had taken place, was uneven, hard, and more or less red. The arytenoid cartilages themselves healthy, but their articular surface laid bare. Mucous membrane of the trachea of pale pink colour, and natural thickness and consistence.

Chest. The lungs did not collapse, when the thorax was opened; they were of large size, and the vesicles generally dilated; the right lung was generally adherent; the left perfectly free, exhibiting at the apex a sort of puckering, opposite a small and very hard mass of gray semi-transparent matter, placed at a distance of half an inch [12 millimeters] from the surface; from this mass a certain number of radiating processes of the same material were given off. Near it were a tuberculous cavity of medium size, lined with pseudo-membrane, and some nodules of hepatized tissue. There was an abundance of gray semi-transparent granulations, diminishing in number from above downwards. In the upper lobe of the right lung, are excavations of rather considerable dimensions, communicating with another seated in the lower; both contained a red, thick, opaque fluid, and were lined with a gray, firm, semi-transparent pseudo-membrane. The rest of the upper lobe contained softened tubercles and gray granulations in abundance. There were numbers of the latter in the lower lobe.—Heart and aorta natural.

Abdomen. Stomach enlarged; mucous membrane gray in the fundus, grayish and mammillated elsewhere, except in one part of its posterior surface near the pylorus. Consistence somewhat increased, where the grayish colour exists.—The twelve patches of Peyer nearest the cæcum present some ulcerations and a small number of semi-cartilaginous-like granulations. Elsewhere, mucous membrane perfectly healthy. That of the large intestine thickened and softened, but still it furnished strips of from half a line to two lines [1 to 4 millimeters] in length, and was not ulcerated.—Liver large and soft; bile in gall-bladder somewhat thicker than natural; spleen small and softish; the rest healthy.

Here, as in the preceding case, there was pain at the upper

part of the thyroid cartilage, or between it and the os hyoides, and deglutition was obstructed; but in the present instance these symptoms were much more strongly marked, were proportional to the extent of existing morbid change, and completely absorbed the patient's attention. The pain was constant, pricking, accompanied with heat, was increased by every movement of the neck, more especially by those required in swallowing; this act became daily more laborious, and for a long time fluids gushed out in part from the nose. The patient had always greater difficulty in swallowing solids than liquids, and he was totally unable to get the former down during the last fifteen days of life. The epiglottis and superior chordæ vocales were completely destroyed,—the lower partially so; so that the anatomical changes appear to have advanced from above downwards, and in all probability the affection of the epiglottis remained simple and uncomplicated for a certain time, was at the outset the sole cause of the pain and difficulty of swallowing, and continued so to the end.

The progress of the symptoms was slow and continuous; the patient had had no venereal disease, and as has been already stated, more particularly in the Summary of the First Part, the tendency to ulceration is sufficiently marked in phthisical subjects to render it unnecessary in the present instance to seek any other cause for its occurrence than the principal malady.

The following case supplies another very remarkable example of the symptoms under consideration.

Case XXII. A maker of artificial flowers, aged 18, and of rather delicate constitution, was admitted into the Hospital of La Charité on the 23d of December, 1824. He had been seventeen months convalescent from alleged ascites, which required the application of seventy-five leeches to the abdomen, and for which he had kept his bed a year, without having had abdominal pain or fever, or having lost his appetite but to a very trifling amount. He had recovered his strength but slowly, and had not altogether regained his flesh. Five months before admission, he had had slight hemoptysis of five days' continuance, followed seven weeks after by cough, expectoration, oppression of breathing, and shortly after that by night-perspirations returning every night. The appetite continued good, and the

bowels regular. When I first saw the patient he had ceased to work only a week.

December 24th, 1824. General pallor of the surface; marked failure of strength; inconsiderable loss of flesh; moderate oppression of breathing; cough not frequent; sputa clear, slightly viscous; chest sonorous, except over a space measuring two inches and four lines [6 centimeters] immediately underneath the left clavicle, where the sound was dull; here, too, the respiration was noisy, with sonorous rhonchus and slight pain; similar rhonchus under the right clavicle, but less marked; no tracheal respiration, pectoriloquy or resonance of the voice in any situation. Pulse somewhat hurried; heat of skin natural; copious night-sweats over the entire surface, without previous rigors. Tongue pale and whitish; appetite somewhat less than in health; thirst natural; stools regular.

Pectoral ptisan; gum-potion; quarter of house-allowance.

January 1st. Sharp pain opposite and to the left of the os hyoides, accompanied with marked heat, increased by coughing, swallowing, or external pressure: some dysphagia, although the tonsils and pharynx are in the natural state.

January 2d. Dysphagia increased; fluids return in part by the nostrils. From this period till that of death, that is, for a lapse of three months and a half, these symptoms persisted with but slight variation; the patient could only drink by mouthfuls, and some drops of ptisan frequently escaped by the nose; deglutition of solids and liquids was equally distressing; the pain, increased in severity as it was by swallowing, occupied the patient's attention completely, and he rarely complained of anything else. Leeches, applied to the neck on the 9th and 11th of January, produced no relief; nor was the advantage derived from a blister, applied opposite the painful spot a few days later, by any means greater.

The character of the voice began to change on the 5th of January. On the 25th, complete aphonia was established, and continued until death. During the closing months the pain in the os hyoides extended downwards to the lower part of the larynx.

There was, generally speaking, much oppression of breathing, and a hurried state of respiration during the two months preceding the fatal event. From the 9th of January he began

to spit some nummulated or ragged sputa, along with clear fluid, in greater or less abundance. The same day the dullness of sound was both more extensive and more marked under the left clavicle than at the time of the patient's admission; some crackling rhonchus was audible there, and lower down the respiration was very obscure. It had the tracheal character, and the air appeared to enter into the stethoscope, when he spoke, under the right clavicle. The 13th of February both these phenomena were detected on both sides, the respiration was weak, and the chest emitted a somewhat dull sound on the left side. At the close of February some of the sputa were striated. On the 4th of April several of them were tinged of a very pale hue. On the 5th the patient went to walk in the garden alone, and had slight hemoptysis, which ceased promptly.

On the 9th of January the pulse beat 85 in the minute, on the 17th, 100. It continued more or less frequent thenceforth. There was more or less heat of skin during the last two months, with general and copious sweats nightly, without previous rigors.

The tongue was sometimes whitish, never red; the appetite, generally speaking, good, digestion easily accomplished, and the patient became very ill-humoured when put upon fever-diet. Diarrhœa set in on the middle of January, was almost continuous, and became considerable at the close of February and beginning of March. Nausea sometimes occurred during cough.

The strength failed rather rapidly, and, nevertheless, as has been seen, the patient went to the garden unassisted eight days before his death. He only became from time to time uneasy about his state.

In the evening of the 10th of April the features appeared somewhat decomposed and the respiration more embarrassed; he then lost consciousness, and expired at 5 a.m., the following morning.

When the diarrhœa set in, rice-water was substituted for the pectoral ptisan; shortly after, the patient also had diascordium with or without opium, which he took without repugnance. He only eat a few rice-creams when the diarrhœa became severe; at other times he had a quarter or half a quarter of house-allowance.

Sectio Cadaveris; *twenty-seven hours after death.*

External appearances. Last stage of marasmus; nothing else remarkable.

Head. Slight sub-arachnoid infiltration; a few miliary non-tuberculous granulations springing from the arachnoid, near the median fissure; one tablespoonful of serosity in each lateral ventricle; brain moderately firm; cortical substance of violet-pink colour, especially inferiorly.

Neck. Epiglottis contracted, one line [2 millimeters] thick near its circumference. Mucous membrane of the inferior surface destroyed; the corresponding sub-mucous tissue thickened, and of pale-pink hue; the upper chordæ vocales deeply ulcerated, the lower superficially so; arytenoid cartilages perfectly healthy, their bases laid bare. Underneath the chordæ vocales the mucous membrane of the trachea had the colour of pale onion-skin, and was slightly thickened, and covered with small ulcerations to an extent of one inch and two lines [3 centimeters] downwards. It was red nearer the bifurcation, and presented in its fleshy portion two ulcerations, one and three lines [2 and 6 millimeters] in diameter.

Chest. General adhesions of the lungs by means of a semi-cartilaginous pseudo-membrane, from one line to one and a half [2 to 3 millimeters] in thickness at their apices,—elsewhere by more or less close cellular membrane. Anfractuous cavity at the apex of the upper lobe of the left side, reaching to the interlobular fissure, of the size of a goose's egg, containing a red, thick, and turbid liquid, invested by a sort of tuberculous detritus, and unprovided with pseudo-membrane. Its walls were thin posteriorly, hard and thick anteriorly, almost solely formed in the former direction by the sort of semi-cartilaginous cap above mentioned, and in the latter by a great quantity of gray and blackish matter, which, with a good number of tubercles and some tuberculous abscesses, occupied nearly the entire of the rest of the lobe. At the upper part of the lower lobe was an excavation, small in size and very uneven on the surface, containing the same kind of liquid as the large cavity; besides these there were great numbers of gray and yellow granulations. The same kinds of morbid change, but to much less extent, existed on the right side.—Mucous membrane of the bronchi, of tolerably bright red colour, exhibits some indurations on the left side only.—Heart and aorta natural.

Abdomen. Anterior wall adherent to the great omentum and intestines by close and short cellular tissue, easily torn. Stomach of moderate size; mucous membrane red and softened in one part of the fundus; grayish near the pylorus, white, mammillated, and of good consistence elsewhere. Near the great curvature, and at two inches and four lines [6 centimeters] distance from the pylorus, an ulceration measuring half an inch [12 millimeters] in diameter, with edges formed of softened, red, and everted mucous membrane, and a fundus of sub-mucous tunic, uneven, and double its natural thickness.—Duodenum natural.—Small intestine contains a great deal of mucus in its upper part, lower down a turbid grayish liquid. Ulcerations in considerable number presented themselves along the entire tract, of larger size at the middle part than at the two extremities of the bowel, (the largest measuring from an inch and a half to three inches and a half [4 to 9 centimeters], the majority from two to three lines [4 to 6 millimeters] in diameter,) were seated on the patches, were of blackish colour, with flat edges, sometimes pushed out by tuberculous granulations. The sub-mucous tissue was somewhat thickened in these spots, and the mucous tunic manifestly thickened between them.—In different parts of the large intestine were ulcerations, the largest of which presented a surface of upwards of seven inches [18 centimeters], and occupied the cæcum and ascending colon. In structure they resembled those of the small intestine, except that they presented a few small grayish granulations in their centre, and were free from tubercles at their edges. There were several ulcerations in the neighbourhood of the anus about the size of a shilling. Mesenteric and meso-colic glands present nothing remarkable.—Liver somewhat soft, mottled with red, and coloured like onion-skin; bile in the gall-bladder natural.—Spleen measures upwards of eight inches [21 centimeters] in height by six inches [15 centimeters] in breadth; consistence strongly marked; tissue of uniform violet-red colour, of fatty and glossy aspect,—a few orifices of vessels only and some very delicate whitish filaments appearing distinct.—Rest healthy.

The symptoms stated to be proper to ulcerations of the epiglottis—pain above the thyroid cartilage, difficulty in swallow-

ing, escape of fluids through the nose—were present in this case to a very remarkable amount, and made the nature of the affection obvious shortly after their establishment. For three months and a half no cessation of these symptoms occurred, some slight variations only, for better or worse, taking place; and, as in the preceding case, these symptoms occupied the patient's entire attention. Change in the character of the voice followed closely on their establishment; so that the affections of the larynx and epiglottis would, in a manner, appear to have commenced at the same time.

As regards the diagnosis of the principal malady, it is to be observed that at the time of the patient's admission he had only coughed for three months; his sputa were, at that period. in no respect characteristic; neither resonance of the voice nor pectoriloquy were present; he had lost but little flesh,—a series of conditions quite insufficient for the detection of the nature of the disease. But the chest furnished a dull sound on percussion under one of the clavicles,—that is to say, in the place where the development of tubercles commences; the patient had had hemoptysis two months before the cough set in, and I did not hesitate to pronounce him phthisical.

The eversion of the edges of the ulceration in the stomach is worthy of note, from its being the only instance of the kind which has fallen under my observation. In analogous cases the mucous membrane, as we have before seen, was cleanly cut, and its natural mode of union with the subjacent cellular membrane retained all round.

The patient had, two years and a half before his death, laboured under an affection, which he believed to have been ascites, but the general adhesions of the peritoneum show sufficiently clearly that the disease was peritonitis,—a view further countenanced by the nature of the treatment which had been adopted.

§ 2. *Symptoms of Ulcerations of the Larynx.*

These symptoms varied with the seat, the extent, and the depth of the ulcerations. Of five patients in whom they only existed at the point of junction of the chordæ vocales, one, and one only, laboured under alteration of voice, from the sixteenth to the twentieth day preceding his death; complete

aphonia existed during the last twenty days of life, and there was some pain in the larynx. The four other individuals only suffered from slight dryness and heat in the throat during the closing weeks of existence.

In nine cases in which small superficial ulcerations were seated either in the ventricles, the interspace between the arytenoid cartilages, or the inferior chordæ vocales, the symptoms noticed were hoarseness, more or less marked alteration in the character of the voice, and heat with pricking pains in the larynx; subsequently the voice became more or less completely extinct. These phenomena, with the exception of the hoarseness, existed to a very slight amount in two of the cases.—In three instances the hoarseness set in eight days, and in the others from six to eight months, before death; pain had been felt for about the same length of time. Aphonia was observed in two patients only.

The same symptoms, developed with much more intensity, existed in eight cases of deep ulcerations in the larynx, accompanied with more or less complete destruction of the chordæ vocales; in these cases they set in from one to five months before death. The hoarseness commenced one or more weeks before the supervention of pain, occasionally several months earlier; aphonia declared itself twenty or thirty days, one or two months, or even more, before the fatal termination; the pain (I allude to cases in which the epiglottis was free from ulceration) was sometimes very sharp, pricking, lancinating, and accompanied with sensation of heat. One patient compared it to that produced by a wound, an idea to which he the more resolutely held from his frequently observing small thready particles of blood in the sputa. The acts of coughing and speaking increased this pain; it varied, from time to time, in intensity, and sometimes disappeared altogether for a few days. In these persons the cough had a peculiar cracked or whistling character; deglutition was performed with facility, unless the epiglottis were more or less deeply ulcerated.

Thus, whatever was the existing variety of ulceration of the larynx, the nature of the symptoms continued the same, but they varied exceedingly in respect of intensity and duration. Hoarseness existed in four fifths of the cases. Pain was pretty frequently absent when the ulcerations were superficial; under

the contrary condition of depth, invariably present and more or less continuous. The same might be said of aphonia. So that we may consider the symptoms of superficial ulceration of the larynx to be slight pain of some duration in the laryngeal region, coupled with more or less marked change in the characters of the voice; whereas sharp, continuous, and oftentimes very severe pain, followed by aphonia, of one or more months' duration, denotes the presence of deep ulceration.[1]

The pains experienced in the region of the larynx, by some phthisical patients who had more or less completely lost their voice, are in some cases perfectly intolerable, especially during the act of swallowing. When not engaged in swallowing, these patients feel a most distressing sensation of heat, and swelling in the larynx; but while deglutition is going forward, it seems to them as if multitudes of needles were driven into the suffering parts; and so acute is the agony, that some patients, though tormented with thirst, cannot muster courage to take a spoonful of fluid. Pain of this terrible character I have chiefly witnessed in private practice, in females whose bodies were not opened; and it is more than probable, from what has been already said on the subject of the epiglottis, that it was rather caused by disease of this organ than of the larynx. Were it not so, the suffering should have been greater during the act of speaking than under any other circumstances; now this was not the fact.

§ 3. *Symptoms of Ulcerations of the Trachea.*

No matter how numerous these ulcerations might have been, they did not commonly give rise to any symptom. One only of these patients, in whom the entire of the mucous membrane investing the fleshy portion of the trachea was destroyed, complained long before death of a feeling of obstruction above and behind the sternum, soon followed by slight sensation of heat. A certain number of individuals complained of pain in the larynx, although there were no ulcerations in that part, and the largest of the tracheal ulcers were seated near the bifurcation,

[1] I have not thought it necessary to detail any cases here, as those scattered through the work sufficiently prove the accuracy of the general description now given.

while those at the upper part of the tube were very small. Paroxysms of dyspnœa came on for several successive days in one case; but they yielded promptly to the application of a blister to the neck. In the other cases, even where the anatomical changes were considerable in amount, the patients lay with their heads low without experiencing any greater difficulty of breathing than those who were free from the ulcerations in question.[1] The sputa presented no character which could be regarded as peculiar to this alteration in the trachea; so that the only symptoms I can possibly ascribe to it, are those experienced by the subject of the following case,—namely, a feeling of obstruction, accompanied with slight sensation of heat behind the upper part of the sternum.

Case XXIII. A girl, aged 23, of sanguineo-lymphatic temperament, large, and strong, not subject to colds, never having been seriously ill, had suffered, for six months, from the majority of the symptoms of phthisis. Expectoration and dyspnœa had set in with the cough, night-perspirations been established for some time, and there had been slight diarrhœa from time to time; the appetite had not failed. The patient began to lose flesh, however, from the commencement of her *cold*. She had neither had hemoptysis, nor pains in the chest, when she was seized, without appreciable cause, with a violent fit of trembling, quickly followed by heat, pain in the right side, and extreme dyspnœa. These symptoms persisted, and on the eleventh day after they had declared themselves, the patient was admitted into the Hospital of La Charité, in other words, on the 9th of December, 1822.

December 10th. *Present state.* Expression of the face animated; supra-orbitar headache; sensation of fatigue in the limbs and loins, pain below the thyroid cartilage and os hyoides; deglutition difficult; slight hoarseness; continuous pricking pain in the right side of the chest, increased by cough and pressure, accompanied with rather marked sensation of heat in the same place; extreme dyspnœa, the patient lies with her head very high; respiration rough, bronchial under the clavicles, tracheal posteriorly and laterally in the lower half of the right side;

[1] Paroxysms of dyspnœa have, as is well known, been placed by writers among the symptoms of ulcerations of the trachea.

œgophony with dull sound in the same place; cough frequent and of cracked character; a few opaline sputa, containing a little air, others completely opaque, thick, and striated with white lines; pulse 100, quick, and tolerably full; heat of skin moderate; tongue somewhat red at the edges, whitish in the centre; pharynx red, sensation of dryness in that part; thirst slight; anorexia; nausea occasionally during the cough; bowels confined.

V.S. to thirteen ounces; decoction of triticum repens with nitrate of potass; gum potion; emollient enema twice.

The bleeding was repeated on the two succeeding days, and twenty leeches applied to the painful side without amendment. On the 13th, a blister, six inches [15 centimeters] broad, was placed on the same part; and on the morning of the 14th, almost all the symptoms were relieved; the pulse had fallen, but the alteration of voice and the pains in the neck remained as before.

The amendment made further progress the following days: the œgophony had disappeared on the 3d of January. Pectoriloquy then became manifest between the shoulder and spine on the right side, and existed in the doubtful form on the left: there had been two paroxysms of dyspnœa in the night. A few days later I again detected œgophony. On the 28th of February the chest sounded perfectly dull under the right clavicle, and no respiratory murmur was audible there; the patient laboured under considerable dyspnœa, and lay with her head high. These symptoms continued till the patient's death, which occurred on the 21st of March.

The pulse continued more or less hurried, the heat of skin variable, considerable in the evening and by night; irregular rigors occurred almost daily, and night-perspirations frequently accompanied with eruptions of sudamina.

The fixed pain between the thyroid cartilage and hyoid bone was constantly more or less severe; the alteration of the voice continued, and lapsed into a state of total aphonia during the closing twenty days. Slight redness without swelling was perceptible in the pharynx, and deglutition at first obstructed, subsequently rendered free, did not become laborious again till the last few weeks of life.—On the 10th of January a new symptom presented itself in addition to these; the patient complained of having experienced for the last few hours a sensation of some obstacle placed behind and immediately above the

sternum, a sensation which occasionally excited involuntary movements of deglutition; neither pricking pain nor heat was felt in the part, and the pain in the throat had ceased. This sensation continued persistently for several weeks; and on the 7th of February and following days, pain of some severity was experienced all along the trachea.

At this period, too, cerebral symptoms announced the occurrence of a new complication. On the 11th of February the patient suffered from giddiness and much headache, lost consciousness for some minutes without any appearance of paralysis; the headache continued, and on the following day the giddiness returned. On the 28th the right side of the face felt as if it had been bruised. On the 2d of March the face was drawn to the left side and the right arm very weak, while the thigh of the same side retained all its strength. Soon after the entire side became equally powerless, and the upper and lower extremities successively the seat of pain, numbness, and a sensation of cold. She felt disagreeable pricking sensations in the right eye, afterwards a sense of heat there; and the right pupil, at first the larger of the two, became very much contracted. On the 8th, while laughing with some of the other patients, she lost consciousness for some minutes. The following morning the cerebral symptoms did not appear to me to have undergone any increase. On the 16th, rather marked prostration, also complete paralysis of the right side; tongue deviates to the right.—19th. The patient, unable to speak, signifies her wants by means of signs. Delirium in the night, followed by general agitation on the 20th. The delirium recurred the next night. On the 21st the right arm was alternately stiff and the seat of spasmodic movements; slight stiffness of the left arm from time to time. This state of things continued till 4 p.m., when tracheal rattle came on, with other evidence of the final struggle, and she expired at midnight.

The appetite, which had materially improved the first few days after the patient's admission, failed rather quickly. During a part of the month of February she had pain in the epigastrium and right iliac fossa, and from time to time nausea. Subsequently she only felt a desire for food at distant intervals, and even then but slightly. On the 7th of February the tongue was a little red, and covered with a great number of

small easily-separable pultaceous patches, which reappeared in the beginning of March. On the 12th the tongue appeared natural, and nausea and bilious vomiting occurred.—She suffered from diarrhœa almost the entire time of her stay at the hospital; it was not abundant, and sometimes accompanied with colic pains and tenesmus.

According as the indications varied she had demulcent ptisans, white decoction, or rice-ptisan, and mustard foot-baths. When the cerebral symptoms came on leeches were applied to the genitals.

Sectio Cadaveris; *thirty-five hours after death.*

External appearances. Second stage of marasmus; nothing else remarkable.

Head. Bones of skull very thick. At the middle and upper part of the left hemisphere, under the arachnoid, and covering a surface of fourteen inches [36 centimeters] in extent, lay a yellow, concrete, membraniform matter, one line [2 millimeters] thick, and apparently developed in the pia mater. Brain somewhat soft, but not particularly vascular; a tablespoonful of serosity in each lateral ventricle; lower half of the septum lucidum softened and pulpy,—some fragments of it floating in the serosity of the ventricles.

Neck. Mucous covering of the inferior surface of the epiglottis entirely destroyed; upper and left chorda vocalis superficially ulcerated; that on the right side almost completely destroyed, the lower less deeply affected. The mucous membrane investing the soft portion of the trachea had disappeared; the corresponding muscular fibres were laid bare, and more or less thickened throughout their entire extent. Six of the cartilaginous rings were denuded, the mucous membrane appearing to have been removed with a punch. The remaining mucous membrane was of slight consistence and pale pink colour.

Chest. *Right* lung adherent at the apex by means of a thick membranous band. Lower down, this lung was invested by a pseudo-membrane about one inch [2 millimeters] thick, of undulating aspect; it covered the diaphragmatic and costal pleuræ also, and contained about three pints and a half [2 litres] of clear serosity. The upper lobe contained two cavities of the size of a walnut, almost completely empty, and communicating with the bronchi; besides these there were softened tubercles.

The two other lobes contained gray granulations in abundance. The *left* lung exhibited nodules on its surface caused by tubercles, and at the apex some cavities of smaller size than those on the right side. The lower lobe was simply a little engorged. —The pericardium contained from five to six ounces of sanguinolent serosity; heart very soft, of medium size and deep livid colour; aorta healthy.

Abdomen. Liver fatty and large; bile in the gall-bladder moderately thick and of brownish colour.—Mucous membrane of the stomach covered with a small quantity of thick and viscid mucus, red, and softened from place to place in the fundus, perfectly healthy within three inches and a half [9 centimeters] of the pylorus, attenuated and mammillated elsewhere.—Duodenum natural.—Numerous yellowish and whitish miliary granulations underneath the mucous membrane of the upper fifty-two inches [130 centimeters] of the small intestine; they then became few in number, and there were none in the lower third. Ulceration of medium size throughout the intestine, at distances of from three and a half to ten inches [9 to 25 centimeters] from each other, and studded with tuberculous granulations: their fundus blackish, and the mucous membrane slightly discoloured, and thickened at the edges of the majority of them. One ulceration, much more extensive than the others, encroached on the ileo-cæcal valve, and passed entirely round the bowel; the mucous membrane was here laid bare and thickened.—There were several ulcerations in the different parts of the large intestine, the mucous membrane of which was whole, and as soft as mucus. They ceased in the rectum four lines and a half [9 millimeters] above the anus. The last of them formed a complete ring, four lines [8 millimeters] wide. Almost all the mesenteric glands were large and transformed into unsoftened tuberculous matter. Some of the meso-colic had undergone the same transformation.—The other viscera were sound.

In spite of their number the morbid changes just described gave rise, each of them in particular, to their own proper symptoms. Those of phthisis were obvious, as likewise those of pleurisy, and of the morbid condition of the brain and its appendages. The ulcerations of the epiglottis were indicated by the seat of the pain, above and opposite the upper part of the thyroid car-

tilage; those of the larynx by the altered state of the voice, terminating in aphonia. Lastly, the sensation of embarrassment felt behind the upper part of the sternum, and then the pain along the trachea during inspiration, might have led to the suspicion of the existence of a more or less advanced alteration of that part. We shall see in a moment that the latter symptom existed also in cases where the mucous membrane of the trachea simply exhibited more or less bright redness, with slight increase of thickness; and this is an additional motive for attaching some importance to it in the diagnosis of the affection before us. The dyspnœa was strongly marked; but the state of the lungs and of the right pleura explains this too easily and too naturally, to allow of our ascribing it to the ulceration of the trachea. It is to be observed, too, that this dyspnœa appeared at the same time as the pleurisy, that is to say, at a period when it may reasonably be believed the alteration in question did not exist.

The anorexia, epigastric pain, and nausea, corresponded pretty accurately to the morbid state of the mucous membrane of the stomach. The diarrhœa was not considerable, but lasted nine months, with but few interruptions; and the intestinal ulcerations, without being very large, were not very small either, and were very numerous, especially in the small intestine. The tenesmus suffered from by the patient, although not severe, might have led the observer to suspect the existence of disease in the mucous membrane of the rectum, and we have seen that, in reality, that membrane was the seat of ulcerations—one of them rendered particularly remarkable by its annular form. In certain cases, then, the majority of complications supervening in the course of protracted chronic affections may, as I have already said, be recognized, even when a considerable amount of debility exists.

The tracheal disease was still more considerable in the following than in the last case, yet here it gave rise to no particular symptom.

Case XXIV. A tailor, aged 24, of weak constitution, and rarely affected with colds, received, in 1814, a kick from a horse, in the region of the pubis. A tumour formed in the place, slowly enlarged, and at length opened spontaneously, leaving as its effect a fistula, which had been alternately open and closed for

the last nine years. For the five weeks preceding the patient's admission to the Hospital of La Charité, on the 10th February, 1834, he had suffered from pains in the upper parts of the thighs, which interfered much with walking. He coughed, spit, and had had some slight attacks of hemoptysis during the last nine months. He had had difficulty in expectorating for the last two months, and the sputa sometimes appeared to stop short in the larynx, where a sensation of dryness was felt; there had been rather considerable diarrhœa for the last two months and upwards, during which time the appetite had completely failed.

17th. Face pale; intelligence good; considerable debility; emaciation advanced to its third stage; pains in the upper parts of the thighs, increased by walking, to such a degree that he found it almost impossible to attempt this; the fistula, situated above the symphysis pubis, furnished a moderate quantity of thin pus; coughs but seldom; sputa few in number, greenish and opaque, associated with a certain quantity of very clear mucus; oppression of breathing slight; chest sonorous everywhere; neither pectoriloquy nor tracheal respiration; some soft subcrepitant rhonchus at the upper part of the thorax; voice natural; larynx and trachea free from pain; pulse moderately frequent; heat of skin gentle; rigors on rare occasions; abundant perspirations; mouth clammy; tongue somewhat red at the edges; almost complete anorexia; scarcely any thirst; abdomen yielding, and free from pain; six liquid stools.

From this time to the 25th of April, the day of death, the patient felt no uncomfortable sensation along the neck; he only complained of slight pain in the throat, the last few days of his life; the pharynx always continued in the natural state, and the voice unchanged.

The sputa did not obviously change in appearance. On the 6th of March the chest was more sonorous posteriorly on the right than the left side; the voice resounded a little under the right clavicle; and there was mucous rhonchus under the left. April the 22d. Percussion furnished no sound in the latter region; tracheal respiration, with imperfect pectoriloquy, became audible there. The patient lay invariably with his head low.

The perspirations continued more or less general and abundant, in spite of the exhibition of acetate of lead in gradually

increasing doses; the pulse was more or less rapid; there were frequent attacks of rigors, they indeed came on almost every evening.

The appetite improved rather rapidly, in such manner, that in the beginning of March the patient eat half the house-allowance of bread with vegetables; this continued till the closing days of life.

He suffered only from slight diarrhœa until the 19th of April, when it suddenly became abundant without any appreciable cause. In the evening of the following day extremely acute abdominal pain, with prolonged rigors and frequent nausea, supervened. 21st. The pain had diminished much in severity; abdomen tympanitic; tongue red; slight decomposition of the features. 22d. The pain had disappeared; the abdomen was flattened; the bowels constantly acting; debility extreme; and on the 25th, at 10 a.m. the patient expired, after a death-struggle (agonie) of an hour's duration.

He had diascordium, and mixtures containing extract of opium, during the greater part of his stay at the hospital.

Sectio Cadaveris; *twenty-two hours after death.*

External appearances. The rami of the os pubis were denuded of periosteum, looked as though worm-eaten; and were surrounded with grayish, rather thin, not very fetid pus. The muscles naturally inserted into the rami of the pubis, were without any attachment; those forming the walls of the abscess were grayish and greenish, covered with a sort of detritus, of the same colour, and softened. The abscess extended to both thighs.

Head. Two small spoonfuls of serosity in the upper part of the arachnoid; slight infiltration underneath that membrane; pia mater moderately injected; brain healthy; a tablespoonful of serosity in each lateral ventricle.

Neck. Three superficial ulcerations on the laryngeal surface of the epiglottis; intermediate mucous membrane perfectly healthy. A small ulceration at the junction of the chordæ vocales. Mucous membrane of the trachea pale and ulcerated. The ulcerations increased in number and size from above downwards; many of the cartilaginous rings were completely denuded, and not a few exhibited small lenticular cavities; twelve of them were much attenuated in a limited part of their extent;

three presented a solution of continuity about one line [2 millimeters] wide. The muscular fibres of the soft portion were denuded, thickened in several places, and almost completely destroyed opposite three of these ulcerations.

Chest. General cellular adhesions of both lungs to the costal pleuræ. The entire of the upper lobe of the *left* lung was hard, and impermeable to air, except a very thin stratum situated on the surface; a cavity of medium size at the apex, lined partially with a firm, red-coloured pseudo-membrane, lying upon a gray semi-transparent matter, studded with tubercles. The cavity contained a turbid, thick, grayish-coloured liquid, and communicated with the bronchi, which were redder and thicker in its neighbourhood than anywhere else. The remainder of the lobe presented some small excavations, and was in great part transformed into gray matter, in the midst of which appeared numerous granulations, more or less tuberculized. The lower lobe was perfectly healthy.—Some morbid alterations in the *right* lung, but much less marked in amount.—A few superficial and small ulcerations in the bronchi on the left side.—Heart two thirds only of its natural size; aorta not remarkable in any way.

Abdomen. Nearly a pint [$\frac{1}{2}$ litre] of turbid, but not fetid, serosity in the cavity of the abdomen; no communication between this cavity and that of the pubic abscess. Yellowish-coloured, soft, pseudo-membranous adhesions between some of the convolutions of the small intestine, investing also the external surface of the bladder and rectum, underneath which the peritoneum was of bright red colour.—Liver rather small, and healthy; bile, contained in the gall-bladder, moderately abundant, viscous, and greenish coloured. The stomach contained a small quantity of yellow-coloured fluid, and was of large size; the mucous tunic pale, and perfectly healthy in respect of thickness and consistence.—At the commencement of the small intestine, there were several miliary, opaque, sub-mucous granulations, and from the duodenum onwards, ulcerations, at first of small size and few in number, afterwards becoming more numerous and larger towards the cæcum. When small, they were generally partially concealed by the valvulæ conniventes; when of larger size, seated on the patches of Peyer, some of which were completely destroyed, while the others presented

only small ulcerations, in more or less close vicinity to each other, and a few slightly softened tubercles; the muscular membrane was denuded in a few places in the large ulcerations.—Two of very large size in the cæcum and meso-colon, extended entirely round the bowel, measured at least three inches and seven lines [9 centimeters] in length, presented a grayish-coloured, rough surface, formed of the sub-mucous cellular tissue, half a line [1 millimeter] thick, while the corresponding portion of muscular tunic was double that thickness. Between these two large ulcerations appeared six others of small extent, and provided with thinner walls. Others, in some considerable number, narrow, semicircular, and blackish coloured, were seated in the descending colon and rectum, extending almost to the anus. The mucous membrane was of moderate consistence and red colour in this latter part.—Mesenteric glands large, red, and partly tuberculous. Those of the meso-cæcum and meso-colon were in the same state, opposite the ulcerations.—Other abdominal viscera healthy.

Here, as in the preceding case, there were ulcerations in the epiglottis, larynx, and trachea. Insignificant in the two first-mentioned parts, they were extensive, deep, and accompanied with the destruction of a good number of fibro-cartilages in the third; none of them had given rise to symptoms. In vain did I put all necessary questions to the patient, in order to substantiate the existence of such symptoms as might have appertained to tracheal ulceration; I could only obtain a total denial of their presence. This could not be ascribed to defect in intelligence on the part of the patient,—endowed, as he was, with good sense and good memory,—nor to his state of debility. I may, in support of the last point, refer to my published cases of croup in the adult,[1] almost all of them referring to debilitated individuals, who, nevertheless, suffered invariably from more or less sharp pain along the trachea. I may particularly draw attention, among other examples, to the case of a woman who died phthisical, and having been seized with croup in the last stage of marasmus, experienced a sensation of heat and pain along the trachea, at the time when the symptoms of the latter affection were very manifest. It is consequently probable, that

[1] Mémoires ou Recherches anatomico-pathologiques. Paris, 1826, p. 203.

in the case now before us, and in similar ones, the absence of symptoms was an effect of the extremely slow progress of the disease.

Although the precise time of origin of the tracheal disease cannot be traced, it is nevertheless presumable that it commenced at a very distant period. This appears to be almost proved by the solution of continuity of several of the fibro-cartilages, and by the nearly complete destruction of the fleshy portion of the trachea in several places; these changes must, in truth, have required a considerable time for their production. It is further to be remarked, that I never observed the former of these changes except in this single instance, and in no other had the destruction of the muscular tunic advanced so far.

The bronchi, we may observe, were only ulcerated on the left side, that is, the side of the largest cavity; where, too, they were redder and thicker than anywhere else. This fact helps to confirm what has been already said upon one of the causes of ulceration of the air-passages, and upon the influence of the sputa in producing local phlogosis.

The slight amount of diarrhœa in this case, until just before death, in spite of the number and extent of the intestinal ulcerations, also deserves mention. This disparity between symptoms and anatomical change is, in truth, of rare occurrence; and depended, perhaps, upon the sub-mucous membrane not having been destroyed opposite the ulcerations of the cæcum and colon, —a circumstance of considerable rarity in such cases. In fact, with the exception of the present case, I have not met with a single instance of intestinal ulcerations so large as those in question, without the mucous membrane (in a state of thickening) being more or less completely laid bare.

When *inflammation of the mucous membrane of the trachea* (characterized by redness—generally of very bright hue, and sometimes associated with slight thickening or softening,) existed *without ulcerations*, the patients in certain cases suffered from more or less sharp pain, accompanied with a sensation of heat along the neck. Three among seventeen patients exemplified this condition of things; five others experienced pain in the throat or larynx for a rather considerable length of time, although those parts were not the seat of the slightest change of structure.

If we view the first three cases in connexion with those of croup, in which pain and heat are almost invariably experienced along the trachea, we shall be led to consider these symptoms, when arising in the course of phthisis, as the result of inflammation of the tracheal mucous membrane. Perhaps it would even be correct to refer to the same cause, pain felt in the throat and larynx, when deglutition is easy and the voice unaffected; for pain in the throat accompanying inflammation of the trachea is perfectly assimilable to the itching of the extremity of the glans penis in cases of calculus in the bladder.

Hoarseness existed in some cases, unattended with either ulceration or inflammation of the mucous membrane of the larynx; but under these circumstances it lasted a short while only, was unaccompanied with pain in the throat, and occurred at various periods of the affection.

We may conclude generally from what has been said, that ulcerations of the larynx gave rise in the majority of cases to their own proper symptoms;—that those of the epiglottis, when small, were commonly latent;—that those of the trachea produced no special symptoms except in one case;—that simple ulceration of this part of the air-passages excited a sensation of heat and pain there in several cases, or the pain was referred to the throat and larynx.

SECTION XIII.—PNEUMONIA.

Pneumonia frequently supervenes in phthisical subjects at variable periods of the chief malady, either during its course or towards its close.

When pneumonia occurred at an unadvanced period of the disease, while the patients were still able to pursue their ordinary avocations, and while their strength and flesh had not as yet materially failed, it displayed itself with the series of symptoms ordinarily accompanying it, when developed in persons in perfect health. But these symptoms were generally of slight severity, even when tuberculous cavities had already formed at the apices of the lungs; as if cavities and tubercles, actual foreign bodies in respect of these organs, were the principal exciting cause of the inflammation of the pulmonary parenchyma, and must for this reason diminish the peril attaching to it.

The slight seriousness of pneumonia arising in the course of phthisis, when the disease is unadvanced, has also been noticed by M. Andral. This observer mentions too, (as I have myself sometimes seen,) that it is not rare to meet with phthisical individuals who have experienced well-marked symptoms of pneumonia twelve or fifteen times in the course of their malady. And M. Grisolle, in his admirable treatise upon Pneumonia, concludes, from the facts before him, that that affection, when ocurring in the course of phthisis, only accelerates the progress of the latter in a small number of cases ;—that, limited most commonly to a small surface and to the neighbourhood of the tubercles, it is not accompanied with very severe symptoms ;—that it follows a regular course, of an average duration of from twelve to fifteen days, is almost constantly followed by recovery, and does not appear to aggravate the primary disease.[1]

No doubt the last-stated proposition ill accords with generally received opinion ; it clashes directly with the statements of M. Andral, who, a few lines below the admission above cited, assures his readers that intercurrent pneumonia, too often neglected, or altogether escaping detection, causes the premature death of a great number of patients ; and that in cases where it does not immediately entail their destruction, it is always detrimental, inasmuch as it promotes the development of new crops of tubercles, and hastens the period of their softening.[2]

Nevertheless I believe the proposition of M. Grisolle to be true, applied, as it has been by him, to intercurrent pneumonia, developed when the tuberculous disease is not far advanced ; at least it is conformable to what I have myself observed.

Another fact which deserves mention is, that pneumonia affecting the upper and anterior part of the lungs, without a trace of the disease existing posteriorly, is tuberculous. At least I have constantly found it so ; to such a degree, that in obscure cases, this localization of pneumonic inflammation might lead to the diagnosis of tuberculous disease previously undiscovered.

When pneumonia occurred towards the close of life, and

[1] Traité pratique de la Pneumonie aux différents âges. Paris, 1841.

[2] Clinique Médicale. 2ème éd. t. iv, p. 224.

occupied at the same time a very limited extent of lung,—it was generally unattended by symptoms : but when spread over a certain surface, the patients, in the majority of instances, (about five eighths of the whole number, experienced pain, three, four, or five days before death, in one side of the chest. At the same time the respiratory murmur became feeble, and mingled with fine crepitation ; percussion furnished a dull sound in the same place, and the sputa sometimes acquired a little viscidity, without, nevertheless, exhibiting the character they present when pneumonia attacks an individual not debilitated by previous maladies. These symptoms sufficed, when present, to announce the invasion of the complication upon which they depended.

But on the other hand, (and this distinction is readily intelligible,) unlike the pneumonia which occurs at an early period of phthisis, that arising in the closing periods of the disease is almost necessarily fatal.

SECTION XIV.—PLEURISY.

Like pneumonia, pleurisy occurred, as I have already said, at very various periods of the affection ; sometimes at an early stage, when there were probably only a few tubercles in the lungs ; sometimes at the close of the disease. But the mode of progress and the severity of the two affections differed.

While pneumonia developed during the early periods of the course of phthisis, almost constantly ended favorably, pleurisy was rarely cured ; to such a degree, that, at the time the first edition of this work appeared, I had only known it to disappear completely in one case. There can be no doubt, from this fact, that pleurisy and pneumonia exercise a very different influence on the progress of phthisis ; that while the one produces no evident effect in this direction, the other (pleurisy) must in a great number of cases accelerate the fatal termination of the disease.

It is to be understood, however, that severe pleurisy is here referred to, such as is accompanied with more or less abundant effusion ; for dry pleurisy, which occurs almost inevitably in the course of phthisis, and is not accompanied with appreciable change in the sonorousness of the chest, or in the phenomena

of auscultation, is probably without influence on the progress of the primary malady; or if any influence be really exercised, it is slight in amount, and completely inappreciable.

I would further observe, and the point is not without its importance, that while dry pleurisy occurring in the course of tuberculous disease—that which is commonly announced by transitory local pains, now felt on the right side, now on the left,—while this pleurisy is commonly double, so also is, occasionally, pleuritic inflammation of serious character, that accompanied with more or less abundant effusion. The latter morbid state, once ascertained to exist, announces, almost with positive certainty, the presence of a tuberculous affection, which might, till that moment, have escaped detection. At least I am perfectly correct in affirming, that I have never so far seen the description of pleurisy in question in individuals whose lungs were perfectly sound, having only met with it in tuberculous subjects, or in those affected with gangrene of both lungs. Hence it is that the expression "double pleurisy" is in my estimation synonymous with tubercle, or at the least with organic affection of the lungs.

When developed during the closing days of life, pleurisy still gave rise, in the majority of cases submitted to my observation, to symptoms capable of ensuring its detection. Thus seven of the eleven patients who were so affected had experienced rather acute pain in one side of the chest, three, nine, eleven, and seventeen days before death. There was an increase of the usual heat of skin and of thirst, and the pulse became more hurried in three subjects; œgophony was audible in two cases, and I should doubtless have discovered it more frequently were it always possibly to submit dying patients to a full examination. A time comes when their debility is so great, that one justly apprehends increasing it by any kind of movement, even of the passive kind; and the observer refrains from an examination which would not be unattended with danger to the patient. Be this as it may, in the case of pleurisy, as of pneumonia occurring at the close of life, the symptoms were sufficiently well marked to allow of the outset of the disease being fixed with accuracy, and to enable the physician to satisfy himself that it preceded death by a few days only.

SECTION XV.—GENITAL FUNCTIONS.

§ 1. *In Males.*

I have, in several instances, made inquiry of phthisical patients respecting the state of their amative propensities, and in every instance these have appeared to me to have failed in proportion to the loss of strength, the general uneasiness, and the other symptoms,—very much in the same manner as in individuals affected with any other kind of chronic ailment and enfeebled to a similar amount. However, where the tuberculous affection has as yet made but slight progress, and but slight diminution of strength has taken place, though sufficient to prevent the patient from following his usual avocations, it may be that some of them experience stronger sexual desires than in the state of perfect health. This would be easily explained as an effect of idleness, the most favorable condition for the play of imagination in such matters. But it would be truly surprising if, while all the functions were deteriorated in vigour, those of generation should acquire special energy. And, in fact, numerous phthisical patients, questioned by me on the subject, since the publication of the former edition, have invariably proved by their replies that the general opinion of medical men upon this point is erroneous. The great majority, indeed, replied to my question, whether their sexual passions had become more strongly developed than in good health, in such manner as to show that they considered the inquiry not a little absurd.

§ 2. *In Females.*

The catamenial discharge ceased at a more or less advanced period of the disease. In one single case it continued till the fatal termination, but occurred irregularly, and in small quantity; during the final three months it recurred every tenth day. The patient in this case had been nine months and a half ill, and had dry cough during all that period; the post-mortem examination disclosed numerous tuberculous cavities in the lungs,—the uterus was small and healthy. In other cases irre-

gularity in the discharge, either in respect of quantity or periodicity, preceded total suppression; and in all of these, with the exception of more or less marked diminution in point of bulk, the uterus was perfectly healthy. Here we have an additional proof of what I have already had occasion several times to remark, that disturbance of a given function does not always suppose alteration of structure, at least to an appreciable amount, in the organ performing it.

When the total duration of the pulmonary disease was under a year, the suppression of the menses took place, on an average, in the middle of its course. If the disease did not run its course in less than from one to three years, the discharge did not cease till the last third. However, we should have a very imperfect notion of the irregularities of menstruation in phthisical subjects, were we not to understand its possible limits in either direction. Thus a young woman, in whom the pulmonary affection lasted three years, ceased to menstruate at the close of the thirteenth month; whereas in another person, of about the same age, and in whom the disease ran an equally protracted course, the menses returned periodically, until the month preceding death.

In cases where phthisis ran a very slow course, I have not succeeded in detecting the cause which retarded or accelerated the suppression of the periodical discharge. When the affection proved fatal in less than a year, the suppression was commonly coeval with the establishment of fever; that is to say, it occurred at a period when the influence of the main disease on the functions of the different organs became more evident and more real.

Menstruation having continued with some regularity, in certain cases, to the last month of existence, it is conceivable that pregnancy should take place, and pass naturally through its various periods in phthisis. I have observed the fact twice. The most remarkable of these cases was that of a woman who died in the last stage of marasmus, three weeks after having been confined of an extremely robust infant. Her lungs contained a great number of tuberculous cavities.

My own observation has not placed me in a condition to determine whether pregnancy is, or is not, capable of retarding the progress of phthisis; and it will be readily understood that a very large number of cases (perhaps even sustained observation for a considerable number of years, in an establishment for

the reception of pregnant women) would be required, in order to justify any positive assertion on the subject. Nevertheless, I cannot refrain from observing, that there is, perhaps, some error and confusion on the part of those who admit the reality of the influence in question. The fact might be, in truth, that several of the symptoms of phthisis become somewhat more obscure during pregnancy than when the uterus is in the empty state, without the rapidity of advance of the tuberculous disease being a whit the less. On the other hand, it is not impossible that the progress of phthisis might be more marked, after confinement, than at any other period; and the difference observed in the course of the disease, before and after that event, might be another cause of error. But I shall not say anything further on this subject for the present, as I intend returning to it when engaged with the consideration of the causes of the disease.

SECTION XVI.—CEREBRAL SYMPTOMS.

Cerebral symptoms may occur at any period of the disease —when cavities have formed, or when crude tubercles, or semi-transparent gray granulations, constitute the whole amount of change. They are almost always connected with the development of tuberculous granulations in the pia mater; from the moment of their appearance they render the prognosis of phthisis still more unfavorable than it was before; were it only for this reason, they deserve to be detailed with some fulness.

These symptoms were first made the subject of study in children, subsequently in adults. I have often had occasion to observe them, since the publication of the former edition of this work, both before and after the appearance of M. Lediberder's interesting essay, from which I shall mainly draw my description of the affection termed tuberculous meningitis.[1] To this description I shall limit myself in the present section.

This affection which arises, as I have said, at very variable periods of the original malady, commences with headache, gene-

[1] Essai sur l'affection tuberculeuse aigue de la pie-mère, chez l'adulte. Thèses de Paris, Déc. 1837.

rally of great severity, especially in the forehead. This headache, which is continuous, the patients seek to relieve by holding their head in their hands. At the same time the face, contrary to the usual state of things, becomes alternately pale and red; the intellectual faculties fail; symptoms of paralysis are rarely observed at this period; repeated vomiting occurs almost invariably from the first day, at the time cephalalgia declares itself,—and the almost constant association from the outset of these two symptoms, in subjects known to be phthisical, constitutes in itself a strong indication of the existence of a certain number of tubercles in the meninges.

The cephalalgia continues for a space of time varying from three to twelve days; and is often marked by paroxysmal exacerbations, which draw cries from the patients,—cries of the kind termed hydrencephalic, with their mournful and shrill, piercing character. The face assumes a bewildered expression, soon replaced by total absence of expression, reminding the observer, as M. Rufz remarks, of the countenance of idiots.[1] The look becomes slow; the pupils, contracted the first few days, cease to be so, and soon dilate. The patients cease to be aware of their own sufferings, and from the fourth to the sixth day from the commencement of the headache, sometimes later, they are seized with quiet delirium,—sometimes, however, attended with agitation, which is, in the majority of cases, connected with an excited state of the general sensibility. Somnolence, and then coma, occurs in the intervals between the attacks of delirium. Hemiplegia, when it exists, generally sets in some days after the headache. Instead of affecting an entire side of the body, the paralysis sometimes implicates only a part of the face, or one of the eyelids; and persistent contraction is observed in some cases for a certain time—from two to six days before death—instead of paralysis. Vomiting generally continues three or four days; more rarely eight or nine—very rarely also, twenty-four hours only.

Changes of a remarkable character take place in the functions of respiration and circulation. The respiration becomes

[1] The look is, in those cases, says M. Rufz, extremely slow, the pupils extremely wide, the globe of the eye sluggish in its movements; or the eyelids are closed, and there is photophobia, especially when the headache is intense.

less deep, and less frequent, the dyspnœa diminishes or disappears, except during the closing days, when it generally increases much, proportionally too to the somnolence. The fever diminishes, or even ceases almost completely, even when extensive cavities exist in the apices of the lungs; but at the close it returns with great violence; the pulse is very rarely irregular; the temperature of the skin falls and rises with the pulse; the strength fails daily, and the stools are eventually passed involuntarily.

The duration of the disease varies most commonly between eight and fifteen days,—rarely more or less. Intermittences in its course are of unusual occurrence, and when they do occur, of more or less perfect character, they do so only (according to M. Lediberder) during the three or four last days of life.

Although the course of meningitis is not always the same, it may in the majority of cases, in adult age as in infancy, be divided into three periods. The first (the duration of which may vary from three to twelve days) is characterized by headache, vomiting, the peculiar alteration of the features referred to, a more or less marked modification in the intellectual faculties and functions of the organs of sense, the suspension of some of the symptoms of phthisis, diminution of fever and of strength, occasionally somnolence, and partial paralysis. The second period (the duration of which is not less variable than that of the first) has for its principal phenomena restlessness, with more or less increase of sensibility, obtuseness of the senses, and diminution of the febrile symptoms. Lastly, the final period is distinguished by abolition of the intellectual faculties, and by coma, which reaches its maximum the last day.

The three following cases (collected by M. Lediberder at the Hospital of La Pitié, either in my wards, or in those of M. Clément,) supply the verification, at least partially, of what precedes. They are taken from the 'Archives of the Medical Society of Observation,' and are all three reported with great care, although the absence of some anatomical details is to be regretted.

Case XXV. A hosier, aged 21, of middle stature, with chesnut hair, fine skin, and high colour, was admitted into the Hospital of La Pitié on the 2d of October, 1837. His father, who

was of strong constitution, died at the age of forty-five, of an acute disease; his mother was in very good health. Of nine brothers and sisters one only had died in early years from some unknown disease; the eight others enjoyed good health. The patient, who had been in Paris for the last eighteen months, had arrived in robust health, having till then had good food and lodging, and had already commenced business as a hosier. Since his arrival at Paris he had lived less nutritiously than before, committed excesses in wine and spirits sometimes, and slept, with six others, in an ill-ventilated room.

Five months after his arrival in Paris, and thirteen before his admission into the wards of La Pitié, the patient commenced to cough, and lose flesh; in the month of March preceding he had stitch in the side, accompanied with oppression of breathing, and increase of cough; and since that period had not completely recovered. However, the lot having fallen on him for the conscription, he passed an examination to obtain exemption; and the motives for such favour, which he adduced, not having been adjudged sufficient, he sought on the same day to drown his grief in wine.

The following day: general uneasiness and headache; he did not give up his work, however, till the afternoon of the 23d, when he returned to his lodgings, at rather an early hour, on account of increase of headache, with vomiting. This headache continued, and became severe the succeeding days, being always chiefly seated in the forehead; the vomiting continued six days, and on the three last days of September there was delirium, with general agitation, on the night of the 30th, the patient rising from bed, and running about in his shirt.

October 1st. In the evening, according to the testimony of one of his brothers, to whom this account of the commemorative symptoms is due, the agitation ceased, he spoke no more, ceased to recognize the people about him; and his limbs became so rigidly flexed, that it was found impossible to stretch them.

October 2d. *Present state.* The patient lies on his back; face highly coloured, without expression; no answer given to questions; pupils three lines [6 millimeters] wide, the left a little more so than the right; lids drooping; slight strabismus; jaws closed and with difficulty separated; sensibility of skin obtuse; pulse 64, regular, rather full; skin moist, not hot; respiration

suspirious; neither cough nor oppression of breathing since the outset. Auscultation and percussion disclose nothing remarkable. Deglutition easily performed from a sucking bottle, a spoon having been previously placed between the lips; abdomen sunken, not tender under pressure; no stool for the last three days; urine involuntary for the last twenty-four hours.

Twenty leeches behind the ears; fifteen grains of calomel to be taken in doses of a grain and a half every hour; purgative enema; sinapisms to the lower extremities; lemonade.

In the evening, pulse 88, without fulness; the pupils do not contract when exposed to the light of a candle; the patient lost upwards of four ounces of blood by the leeches.

3d. The night was quiet; pulse 92; the rest as yesterday.

V.S. to thirteen ounces; Seidlitz water; ice to the head; sinapisms to the lower extremities.

Only about three ounces of blood were obtained; and half an hour after the bleeding, the respiration was more hurried than before, and accompanied with a noisy rhonchus.

In the evening, respiration 44; the patient did not feel the sinapisms, though they reddened the skin well. The other symptoms as in the morning.

October 4th. The tracheal rhonchus persists; respiration 60; pulse 120, regular, small; no contortions of the face; eyes open; pupils slightly contractile; the right measures three lines [6 millimeters], the left four lines [8 millimeters] in diameter; the patient recognized his brother a moment after having said that he could not see. He moves his arm before him frequently; sensibility exceedingly obtuse; percussion furnishes a dull sound posteriorly on the right side in the lower half of the chest; the persistent contraction of the limbs has ceased.

Pergat.

In the evening the sinapisms were felt well, for the first time; tongue well protruded; the patient hears; slight strabismus; sensibility and nosticity as yesterday; pulse 92, moderately full; one liquid stool.

Twelve leeches to the anus.

The leech-bites continued to bleed from 7 o'clock in the evening till 3 o'clock in the morning; the patient drank three small jugs of ptisan during the night.—October 5th. Respiration 34; the tracheal rhonchus completely gone; pulse moderately

full; face less red, but still expressionless; speech somewhat less difficult than before; intelligence still far from being in a satisfactory state, the patient speaks as if he saw objects which were in reality invisible.

Pergat; blister to the nape of the neck.

During the day three stools; delirium; the embarrassment of respiration returns; he does not know his brother.

The delirium continued the whole night, and had not ceased in the morning of the 8th; face pale; features decomposed; pupils of equal diameter, namely, four lines and a half [9 millimeters], immovable; strabismus; intellect completely gone, as also the faculty of hearing; sensibility almost extinct; movements the same on both sides of the body; tracheal rattle returned; respiration 48; deglutition very laborious, and brings on cough; abdomen somewhat tympanitic; skin rather cold than hot, slightly moist; numerous sudamina on the neck, chest, and abdomen. The patient expired at 1 p.m.

Sectio Cadaveris; *twenty hours after death; weather moderately warm, and somewhat moist.*

External appearances. Strong cadaveric rigidity, equally marked in all the limbs; slight heat of the walls of the abdomen, considerable in the interior.

Head. A few black and fibrinous clots mixed with fluid blood in the sinuses of the dura mater. Glands of Pacchioni numerous on the arachnoid, near the central fissure.—Subarachnoid infiltration to a slight amount; pia mater vascular, removable without carrying any of the cortical substance along with it. At the base of the brain in the space comprised between the commissure of the optic nerves and the pons Varolii on the one hand, and the fissures of Sylvius on the other, the membranes are opaque and firm, and from one to one and a half lines [2 to 3 millimeters] thick. The pia mater in the fissures of Sylvius, especially the right, is filled with gray semi-transparent substance, either in solid masses, or formed of a multitude of granulations of the size of a small pin's head, rarely larger. The middle cerebral arteries, invested by this morbid matter, do not exhibit any appreciable alteration. Subjacent cortical substance perfectly healthy. Optic nerves slightly injected in the punctiform variety, and also softened to the depth of about half a line [1 millimeter]. The same is true of the tuber

cinereum and corpora albicantia.—The lateral ventricles contain each a tablespoonful of serosity, and their walls, like the rest of the encephalon, are perfectly sound.

Neck. Nothing remarkable in the larynx.

Chest. The pericardium contains an ounce of clear-coloured and limpid serosity. Heart not thickened; contains fluid blood mixed with air.—Pleura generally adherent on both sides; the adhesions are cellular, and pretty easily torn on the left side; but hard, cartilaginous-like, and from one to four lines [2 to 8 millimeters] thick on the right. These pseudo-membranes are separated inferiorly, for a space of about four inches by purulent fluid mixed with a great quantity of grumous particles, and under the costal pleura are a great number of small gray semi-transparent granulations, which cause slight protrusion of the membrane. The lungs are light, contain a very little red spumous fluid in the lower and posterior fifth of their substance; and present at the apex very small gray semi-transparent granulations, more abundant at the periphery of the organs than elsewhere, and associated with some few others of a little larger size, quite at the apex, and manifestly tuberculous in the central point.—Bronchi perfectly healthy; bronchial glands large, grayish, and blackish coloured towards the periphery, with a little opaque matter in the centre. No vesicular emphysema nor dilatation of the bronchi.

Abdomen. About two ounces of lemon-coloured non-flocculent serosity in the peritoneum; numerous adhesions of old standing on the surface of the liver. The surface of the organ is generally uneven, from the presence of a rather considerable number of gray semi-transparent granulations, like those of the pia mater, developed on its attached surface. These granulations, of smaller dimension than a millet-seed, are also very numerous in the substance of the great omentum.—The stomach contains about an ounce of transparent tenacious mucus; mucous tunic perfectly healthy.—Yellowish mucus in the upper part of the small intestine; greenish in the lower. Mucous membrane healthy in every respect, except in its lower two fifths, where are six small ulcerations, varying from four to five lines [8 to 10 millimeters] in length, uneven, with thick perpendicularly cut edges, and red granular fundus, formed of the sub-mucous cellular tissue, or of the muscular tunic.—The large

intestine contains pultaceous fæces; and its mucous membrane, which is of grayish colour, gives stripes of from three to five lines [6 to 10 millimeters] in length.—Mesenteric glands perfectly healthy; as also the liver, with the exception of a few small granulations seated immediately under the peritoneum.—Nothing else worthy of note.

Here, as it cannot have failed to strike the reader, the symptoms of meningitis were as strongly marked as possible; the patient experienced in a manner all those indicated in the general description of the malady, even to the remittence occurring at the close. For this reason no doubt could be entertained as to the nature of the affection, which commenced so abruptly, and threatened at once to prove fatal within a very brief period. After having coughed for thirteen months, slightly rather than otherwise, and lost a little flesh, this patient, whose health was not then sufficiently affected to render him unfit for military service, suddenly experienced, after mental annoyance and a slight debauch in wine, rather severe headache, quickly followed by vomiting. This latter phenomenon continued five or six days, disappearing then at the same time as delirium of some intensity set in;—a delirium, during the continuance of which, neither cough nor oppression of breathing was observed,—which lasted uninterruptedly for three days, and after which the patient first came under my observation at the hospital, namely, on the eleventh day of the disease. The face was then expressionless; the pupils dilated; the lids drooping; the axes of vision somewhat divergent; all intellect gone; the cutaneous sensibility very obtuse; the jaws contracted; deglutition slow, and very imperfect; the pulse tranquil; the respiration not hurried. After two days rather active treatment the intellectual faculties were somewhat restored, without a corresponding improvement in the state of cutaneous sensibility; the pulse was not hurried; the tracheal rattle observed on the day following the patient's admission, ceased for twenty-four hours, as likewise the persistent contraction of the limbs, and deglutition became easy. But the delirium returned, accompanied with the most severe symptoms, and the patient expired fifteen days after the outset of the cerebral symptoms. At the post-mortem examination, besides a few pulmonary tubercles, gray semi-transpa-

rent granulations, in great number and of very small size, were found in the fissures of Sylvius.

Thus, from the outset, headache, vomiting, diminution or complete cessation of cough or oppression of breathing, followed by delirium, with slowness of the circulation, as soon as this was examined, were noticed: these symptoms, notwithstanding the deficiency of evidence from auscultation and percussion, were quite enough to denote the existence of tuberculous meningitis.

I agree with M. Lediberder, in the opinion that the gray semi-transparent granulations found in the fissures of Sylvius were suddenly developed, in an acute manner, at the very moment when the cerebral symptoms appeared for the first time. For until granulations have actually been known to exist, and found in the fissures of Sylvius, without being preceded by any of the symptoms enumerated,—symptoms which have hitherto been always observed in greater or less number in such cases,—there is no just motive for believing that these granulations, or a certain number of them, can have existed for some time, in the latent state. Nevertheless such a circumstance is by no means repugnant to reason.

In consequence of the rapidity with which the three things followed each other, one would on first consideration be tempted to believe that the mental distress suffered by the patient, the subsequent debauch, and the cerebral symptoms by which they were succeeded, stood to each other in the relation of cause and effect. And we might be disposed to infer that strong moral impressions are capable of exercising very injurious influence on the brain and meninges. But when, on the other hand, we consider, that in the case before us, the peritoneum was the seat of the same kind of granulations as the meninges, we must hesitate to adopt that opinion, and rather incline to the notion that the moral disturbance and excess committed were not the exciting cause of the formation of the meningeal granulations, but merely coincident phenomena.

The following case, though differing from the last in several points relating to the symptoms and morbid appearances is of no less interest than this.

Case XXVI. A mason, aged 17, of small stature, with deep chesnut-coloured hair, a tolerably well-developed muscular system

and fine skin, was admitted into the Hospital of La Pitié, the 25th of August, 1837. His father is of robust make, and enjoys good health; his mother died in 1835, after an illness of two months, accompanied with cough, and a good deal of emaciation. He had been five months at Paris, inhabited a good-sized, well-ventilated room, and lived upon nutritious food; his health was very good for the first two months after his arrival, according to the account of one of his relations, from whom all these particulars were obtained; since that period he has had dry cough, without obvious emaciation, complained of headache, and yet continued to work, although lazily, till the 12th August.

From that day he suffered from general sensation of lassitude, burning heat of skin, chilliness, without rigors, increase of his headache, which became general, though more severe in the forehead than elsewhere. However, the various functions of sense remained unaffected, neither nausea nor vomiting occurred, the abdomen was a little painful, the bowels costive. The patient now kept his bed, took hot wine with sugar, without any appreciable change in his state, which remained the same also on the 13th and 14th.

15th. He was bled from the arm, and had sinapisms applied without relief.

16th. Headache increased in severity; heat of skin as before; vomiting took place, and recurred frequently; abdomen painful; no stool since the 14th. Twelve leeches, applied to the epigastrium, produced no apparent effect on the symptoms.

After three days' continuance, the vomiting ceased, and the appetite returned, but was capricious.

23d. Ten leeches, applied behind the ears, fail in producing any obvious effect: loss of flesh (hitherto scarcely perceptible) now begins to declare itself in an obvious manner; and, on the 25th (the thirteenth day of the disease), the patient was brought to the hospital on a litter.

26th. He lies huddled up in his bed, with his eyes closed, and in a state of somnolency; he is irritated by being roused, and will scarcely answer any questions; this the persons accompanying him ascribe to his vexation at being brought to the hospital, for he had hitherto shown no deficiency of or change in his intellectual faculties; face expressionless; features unaltered; sight confused; pupils equal and contractile, two lines

[4 millimeters] broad; hearing equally good on both sides; complains of headache and giddiness; the cough is dry, but less frequent than before the invasion of the cerebral symptoms; nothing unnatural detected by percussion and auscultation; respiration 21, occasionally suspirious; skin hot, slightly moist; pulse 112, regular, rather full; tongue yellow, greenish, villous, not thickened; thirst somewhat troublesome; entire abdomen painful under pressure; constipation, abundant diarrhœa having existed at first; considerable loss of strength, the patient can scarcely support himself on his legs.

26th: (the first time he was seen by me.) The commemorative symptoms above enumerated not having been at this time ascertained, the patient was supposed to labour under typhoid fever, and a bottle of Seidlitz water was prescribed.

In the course of the day, the patient answered none of the questions put to him, the face was still more expressionless than the preceding day; the pupils wider than in the morning, still with regular outline, and but slightly contractile; deglutition laborious. Twelve leeches were applied behind the ears; these bled abundantly; ice was then placed on the head. He had a copious motion in the evening.

August 27th. The patient no longer recognized his friends. When raised at all quickly in the bed, he cries out, pronounces some unintelligible words, endeavours to strike those around him, and then becomes quiet again when placed on his pillow; his neck is stiff; the pulse 100, and regular; the skin moist, and not hot; respiration 18, often suspirious; stools involuntary, as ever since his admission.

Six grains [4 *decigrammes*] *of calomel, to be taken in doses of a grain and a half every second hour.*

28th and 29th. The preceding symptoms remained stationary; the patient lay constantly on his back; there was slight strabismus; extensive and equal dilatation of the pupils, they are slightly contractile, and five lines [10 millimeters] broad. Occasional traction of the mouth to the left was observed, with almost complete loss of sensibility and contractility. Skin covered with sudamina; he expired the following morning at quarter to 8 a.m.

Sectio Cadaveris; *twenty-five hours after death; weather cold and damp.*

External appearances. Scarcely any fat on the body; muscles

well developed; pupils two lines [4 millimeters] wide; general cadaveric rigidity, equal in all parts of the body.

Head. A spoonful of fluid black blood between the cranium and dura mater. Glands of Pacchioni abundant along the median fissure; slight sub-arachnoid infiltration; pia mater perfectly healthy on the upper surface of the brain. At the base the membranes are firm, opaque, and thick, in the polygonal space between the pons Varolii, the chiasma of the optic nerves, and the fissure of Bichat. This morbid condition is also observed in the fissure of Sylvius on the left side, where, as in the preceding case, infiltrated, gray, semi-transparent matter is seen, mixed with granulations of the same appearance, and slightly less transparent, in the midst of which the middle cerebral artery is unaffected. The granulations lie in close proximity to each other in the anfractuosities, and along the branches of the artery, as far as the base of the pars petrosa of the temporal bone. The same morbid appearances, with the exception of the gray matter, exist in the right fissure of Sylvius. Around the optic nerves, in addition to the gray semi-transparent matter, is a small quantity of tolerably clear, lemon-coloured serosity. The deposit of granulations exhibits itself also on the posterior and anterior cerebral arteries, where those vessels are in some places invested with gray matter.—Chiasma of the optic nerves slightly softened to the depth of one line [2 millimeters]; lateral ventricles slightly dilated, contain each a tablespoonful of transparent serosity. The fornix, diffluent in its central part, presented its natural consistence elsewhere, the softening ceasing gradually. Septum lucidum slightly softened. Nothing else remarkable.

Neck. Œsophagus healthy.

Chest. Heart natural; some black diffluent coagula in the auricles; yellow and fibrinous ones in the ventricles. Two of the aortic sygmoid valves united at their upper edge to an extent of four lines [8 millimeters]. Pericardium healthy; contains only a few drops of limpid serosity.—Right pleura perfectly free from adhesions; in the left, smooth, partial, and tolerably strong adhesions.—Lungs light, somewhat violet in colour anteriorly; violet red-coloured posteriorly; on incision, in this latter direction, an abundant quantity of red and spumous fluid exudes.—No tubercles in the right lung. In the upper lobe of the left are a tolerable number of gray semi-transparent

granulations, and quite at the apex a few yellow, tolerably firm tubercles, varying in diameter from one to two and a half lines [2 to 5 millimeters].—Bronchial glands large; the gland seated at the bifurcation of the trachea is yellow, firm, and tuberculous, with blackish lines, arranged in such manner as to give it a marbled aspect. Another gland, between the bronchi on the left side, exhibits the same appearance.

Abdomen. Stomach of moderate size; internal surface, generally, of pinkish-gray colour, exhibits deep punctiform redness near the cardia; consistence and thickness natural in every part. The small and large intestines, as well as all the abdominal viscera, present nothing remarkable.

Here, again, the symptoms of meningitis, more especially those which commonly declare themselves at its outset, were extremely well marked. It is to be observed, however, that from the moment cough set in (two months before the invasion of the cerebral symptoms) slight headache had existed; and that this continued, uninterruptedly, for two months, in other words, to the period of invasion of the meningitis, eighteen days before the fatal issue. From the latter period, the headache increased in intensity, and was principally seated in the forehead; occasional hot fits and rigors made their appearance at the same time; the appetite failed completely; two days later, vomiting set in, and these symptoms persisted uninterruptedly for eight or ten days, in spite of a tolerably active plan of treatment. At this stage of things the patient was brought to the hospital, and from this moment his intellectual faculties, which (as was alleged) had hitherto remained unaffected, became implicated; he slowly uttered a few monosyllables, in reply to the questions addressed him; the pulse, which had probably fallen below the ordinary standard the first days, now beat 112 in the minute; while respiration was scarcely more frequent than natural, the cough far from troublesome, the functions of the organs of sense unaffected, and the face devoid of all expression. Three days later, all intellect had disappeared, the pupils had become large, and imperfectly contractile; the patient answered not a word to the questions put him; the stools had become involuntary, or at least the patient passed them under him, as he had done for several days. The next day, the attempt to

place him in the sitting posture in his bed, caused him to cry out, and give signs of violent pain; all of which ceased the moment he was replaced on his pillow. The neck was now observed to be rigid; the pulse beat 100, while respiration was only 18 in the minute. After a lapse of three days more, during which the faculties of sensibility and motility rapidly lost their energy, the patient expired. On post-mortem examination, in addition to the gray semi-transparent substance, and the granulations in the fissure of Sylvius, marked softening of the fornix was discovered,—a morbid state which may have played its part in inducing the prostration of strength and insensibility noticed during the closing days of life.

It is perfectly obvious that once the symptoms, experienced by the patient before his admission into the hospital, were ascertained, no doubt could be entertained of the existence of tuberculous meningitis. But it may be inquired, on the evidence of the existence of headache, from the outset of the cough, whether the morbid change of the meninges, in the fissure of Sylvius, might not have originated at the same period as the cough itself, and consequently, at a period very considerably earlier than that to which I have thought it right to refer the development of the meningitis. However, if the fact that the headache was accompanied with cough, on its first appearance, be taken into consideration along with the circumstance that slight cephalalgia is not a rare attendant on the various symptoms marking the invasion of phthisis, in cases where no tuberculous meningitis exists, we shall be inclined to admit very readily that the meningeal affection did not commence earlier than the estimated period. This once admitted, it will no less readily be granted that the symptoms of that affection were very strongly marked.

The reader has, no doubt, remarked that the meningeal disease, in the present instance, originated under circumstances somewhat different from those existing at the same period, in the case of the preceding patient. The outset of the tuberculous affection in the latter instance was, in truth, preceded by a very material change in the habits of the patient; he had for some time been both badly lodged and fed, whereas he had previously been accustomed to inhabit a wholesome room, and to enjoy nourishing food: the subject of the last case had, on the contrary always, as well immediately before his attack as at an

earlier time, been well off in both these respects, and had committed no excess of any kind. I am desirous of pointing out these differences, in order to show the error of deriving conclusions blindly from certain classes of facts, to which I shall have occasion to give full consideration when engaged with the subject of the Causes of Phthisis.

It is further to be observed that, in the present as in the preceding case, the disease appears to have set in abruptly, and that, in the former, no circumstance apparently existed to which such abruptness of invasion could be attributed. Hence an additional reason for not ascribing the meningeal disease in the preceding case to the slight debauch committed by the patient, and the mental distress he had suffered on the eve of the invasion.

Case XXVII. A locksmith, of rather low stature, chesnut hair, blue irides, fine skin, and but slightly developed muscular system, was admitted in November, 1836, into the Hospital of La Pitié, having been then about one month ill. His father had died of an affection of the chest of a year's duration, attended with loss of flesh, and expectoration. One of his sisters, aged sixteen, now laboured under a similar disease; his mother and another sister were in the enjoyment of good health.

His illness had commenced with slight cough, fever, and swelling of the glands of the neck: these symptoms continued, without being accompanied with hemoptysis, and at the beginning of January, there was obvious and material loss of flesh, the face was pale, the organs of sense and the intellectual faculties unaffected, the memory good, the temper very irascible. Under the skin around the lower jaw-bone appeared rounded tuberculated tumours, more prominent on the right than the left side, and scarcely painful to the touch. The cough was extremely frequent, paroxysmal, and often followed by nausea and vomiting; the sputa abundant and thready, like solution of gum; the respiration 24; the respiratory murmur, and the results of percussion natural; the pulse frequent. He perspired slightly at night, when he slept; and had slight diarrhœa from time to time.—Until the 1st of January he was given opiates at night, and Vichy water, and used hydriodate of potass ointment externally. After January the ointment was ex-

changed for soap-plaster, and then diachylum plaster, placed on the tumours, and the use of the Vichy water was continued. The patient was very carefully attended, and eat daily about as much as half the hospital allowance of good food.

The cervical glands, however, continued to enlarge, and at the beginning of March the patient, growing weary of the hospital, insisted upon going out; at this time he with difficulty dragged himself along, and was put out of breath by the slightest movement. He re-entered on the 24th of March, with somewhat less cough than when he left.

25th. Expiration slightly prolonged under the clavicles, and posteriorly in the corresponding regions, without unnatural resonance of the voice; slight evening fever, without habitual headache; he was still well fed.

During the month of April the loss of flesh continued, making somewhat more rapid progress than before; the failure of strength grew daily more obvious; the neck increased in size, and the movements of the jaw became limited in extent, and were effected with difficulty.

During the first fortnight in May the loss of strength was especially remarkable; the appetite failed; vomiting and diarrhœa appeared at distant intervals; the cough remained stationary; there was continued febrile action, but not to any great amount.

May 22d. The patient complains of numbness in the right arm, the sensibility of which is unaffected; intellectual faculties and functions of the organs of sense in the natural state; no drawing of the features; slight headache.

23d and 24th. No change.

25th. In the evening, the patient understands perfectly well what is said to him, but makes ineffectual efforts to speak. The face, none of the features of which are pinched, is expressive of bewilderment, without suffering. Pupils well contracted; right arm almost motionless, about one half less sensibility in it than in the opposite arm; jaws somewhat stiff for some days past; headache gone; scarcely any cough or expectoration; pulse 112; temperature of body almost natural; voice strong.

26th. (At the hour of the visit:) motions of the right arm somewhat less imperfect; mouth opened a little more freely than on the previous day; the patient pronounced some monosyllables abruptly, after having reflected for a long time, and

made signs with his left hand, like those of a man endeavouring to remember something he had forgotten.

Six leeches behind each ear.

In the evening no obvious change; pulse 100, regular, not full; temperature of body natural.

27th. Mouth wide open; tongue well protruded; the patient succeeds, after many efforts, in pronouncing my name in an abrupt manner, but not his own, and he points to the bed-ticket with his name upon it, that I may read what he himself is unable to express. The motions of the right arm are tolerably free, and some pain is felt in the limb.

Sinapisms to be repeated twice.

From the 28th to the 31st, the patient remained tranquil, and in very much the same state; he felt the sinapisms well. Marked somnolence; sensibility of the arm somewhat greater than the previous days; movements still limited; neither cough nor expectoration, as has been the case since the invasion of the cerebral symptoms; pulse from 90 to 100, regular, not full.

Broth; enema.

31st. Erysipelas declared itself in the face, with all its customary characters, extending from left to right to a vertical line, let fall on either side, from the malar bones; it disappeared completely on the fourth day. While this erysipelas was appearing, the somnolence became more continuous, the pulse 100, fuller and regular; the skin somewhat hotter. Neither cough nor expectoration.

June 1st. The somnolence and other symptoms persist; difficulty of speaking as before: the patient pronounces my name tolerably quickly, but his own with much difficulty, and in a far from distinct manner; when asked the name of some object he knows well, he is unable to tell it.

June 2d. Pronounces his name somewhat better than the day before; weakness increased; face without expression; pulse still 100; cries out every moment for people to stay beside him.

In the night of the 2d he cried out continually; the cries he utters, sufficiently loud to prevent his neighbours from sleeping, are without any particular character.

3d. Right arm contracted, from time to time; pronunciation of words almost completely impossible. In the evening strabismus was observed; continual cries day and night.

4th. Rather less crying out; strabismus as before; pulse 140.

5th. The patient expired at 2 p.m., after five hours of death struggle (agonie).

Sectio Cadaveris; *thirty-six hours after death; weather warm and dry.*

External appearances. Fifth [?] stage of marasmus; abdomen somewhat greenish; marked cadaveric rigidity.

Head. Glands of Pacchioni in great number; moderate amount of sub-arachnoid infiltration; pia mater very little injected, exhibiting on the left hemisphere three yellow spots, produced by slight infiltration of serosity of that colour, measuring two lines [4 millimeters] in width, presenting no very evident prominence, and seated in the sulcus corresponding to the fissure of Sylvius. The pia mater in this fissure exhibits at once a grayish and pinkish hue, due partly to gray semi-transparent matter encroaching upon it, increasing its thickness to double the natural amount, and marked with the impressions of the convolutions and sulci on which it is moulded. This matter is removable in a single mass, and is studded with gray granulations somewhat less transparent than itself, none of them exceeding a hemp-seed in size. The middle cerebral artery and its branches pass through the centre of this matter, which forms a sort of canal for them, without exercising any pressure on them, so that their dimensions are the same as on the other side, where there are neither granulations nor gray matter. Throughout the entire of the left fissure of Sylvius, the pia mater, or the gray matter occupying its place, may be removed without carrying along with it any of the cortical substance of the brain, except in three spots where that substance is softened to the depth of half a line [1 millimeter], without accompanying change of colour. The lateral ventricles contain half a tablespoonful of clear serosity; their walls are perfectly healthy, as appears also the rest of the encephalon, under minute examination.

Neck. The skin (itself natural) covers two tumours: one of these, on the right side, extending from the lobule of the ear to the clavicle, is very prominent; the other, on the left, somewhat smaller. Both are formed of tuberculized cervical glands, in the unsoftened state, the larger of them measuring about an inch and three quarters [40 millimeters] in their longest diameter. These glands, isolated in every direction, are united

by a pink, grayish, semi-transparent matter. The sterno-mastoid and omo-hyoid muscles are raised up by these tumours, which exercise no pressure posteriorly, except on the vagus nerve; this is flattened out into a riband shape, without exhibiting any change in respect of colour and consistence. The internal jugular veins, lying against the tumours, resemble, on first sight, canals cut into their substance; but they are perfectly healthy in every respect.

Chest. Each of the pleuræ contains about an ounce [30 grammes] of reddish and limpid serosity; both are perfectly free from adhesions, with the exception of three thin cellular bands, on the right side.—Lungs light, grayish coloured in front, deep red posteriorly, though there is here but a little reddish and spumous fluid. Both are studded at their apices with a great number of crude tubercles, varying in diameter from one to three lines [2 to 6 millimeters] associated with gray semi-transparent granulations, varying in bulk from that of a millet-seed to that of a hemp-seed. The lower contains gray granulations only, and is otherwise perfectly healthy, with the exception of slight interlobular emphysema, not more than one line [2 millimeters] broad. Bronchi perfectly healthy. The largest bronchial glands contain grayish yellow, hard, dry, cretaceous matter in their centre.—Pericardium contains about half an ounce [15 grammes] of serosity; heart natural.

Abdomen. No serosity in the peritoneal cavity; the membrane itself natural. Stomach slightly distended, and scarcely contains two tablespoonfuls of greenish serosity. Opposite the lesser curvature and under the peritoneum are four rounded tuberculous tumours, four lines [8 millimeters] in diameter. Mucous membrane covered with a tolerably thick layer of mucus; otherwise perfectly healthy.—Liver natural; spleen somewhat larger than usual, of good consistence, and containing tubercles of from one to two lines [2 to 4 millimeters] in diameter, in its interior.—Mesenteric glands healthy.

Here the patient, after having for about five months and a half experienced the usual symptoms of phthisis, began to complain of slight pains in the head, attended with seriously increased failure of strength, and, soon after, of numbness in the right arm. Four days after the appearance of this latter symp-

tom, the power of speech was almost completely lost; the patient could with difficulty pronounce a single word, retaining meanwhile, the full use of his intellectual faculties, and of the organs of sense. The right arm was almost completely paralysed in respect of sensibility, his face wore an expression of bewilderment, and for about four days, the jaws had been stiff; the pulse fell a little in frequency and the cough ceased. These symptoms continued with trifling variation for three days, without, however, vomiting or headache occurring. Somnolence then supervened; and erysipelas declared itself in the face, and ran its course with rapidity. The patient next began to utter cries, troublesome to his neighbours, but possessed of no particular character, and continued to do so for forty-eight hours; the right arm became the seat of contraction, and strabismus occurred. Eventually, the patient expired after a death-struggle (agonie) of five hours, in the second stage of marasmus; and on post-mortem examination, among other morbid appearances, gray semi-transparent granulations were found, in the midst of grayish matter of the same kind, but more transparent, seated in the left fissure of Sylvius, and along with this, very slight softening of some spots of the cortical substance in that fissure, &c.

Although in this case, all the symptoms of the affection now under consideration, did not exist, still it was impossible to mistake the nature of the cerebral phenomena, or fail to discover in them the indications of tuberculous meningitis. In truth, a short time before the fatal issue, the patient was seized with slight headache, and almost immediately after his strength failed more than previously, for which none of the symptoms hitherto existing, could account; the jaws felt stiff, and their movements became obstructed; numbness of the right arm supervened, and the face became devoid of all expression. Two or three days later, the paralysis increased greatly, the faculty of speech became so impaired as to make it almost impossible for him to pronounce a word; at the same time the fever and dyspnœa diminished, and next came the cries, the contraction of the limbs, and the strabismus. These symptoms, considered both in themselves and in their mode of sequence, could not be regarded otherwise (developed, as they were, in a tuberculous subject) than as the effects of granular meningitis. It is then to this meningitis, limited in this case to the fissure of Sylvius on one

side of the brain, that we must refer the headache, the stiffness of the jaws, numbness and incomplete paralysis of the right arm of the subject; for the very limited and very slight softening of the cortical substance of the fissure of Sylvius, was doubtless a secondary phenomena in point of time, and it would be a matter of no small difficulty to assign to this morbid condition its precise share in producing the symptoms observed during the closing days of existence.

The slackened state of the circulation and of respiration was one of the first symptoms of meningitis; and although the circumstance be not one of common occurrence in analogous cases, the difficulty experienced in the articulation of sounds deserves to be noticed—a difficulty which could not be traced in any way to the anterior lobes of the brain.

The symptoms enumerated in the general description—symptoms which occurred in the three preceding cases—are also observed in children under the same circumstances. It results in truth, from the cases collected by M. Rufz and Dr. Gerhard of Philadelphia, as likewise from those of M. Piett, that meningitis in children, which it is so commonly the habit to regard as essential, is almost always due to tuberculous disease of the pia mater; and that it is consequently a dependence upon phthisis, and one of the effects of that malady. It is more especially when tuberculous meningitis is considered in this point of view, that we cannot fail to recognize the part taken by M. Rufz and Dr. Gerhard, in making the disease known to the profession.

The study of this species of meningitis is the more worthy of engaging the attention of the pathologist, from the fact that this affection, like chronic peritonitis, often attacks subjects in whom the tuberculous affection of the lungs has not yet made great advance—in other words, subjects who might have survived a long time had the meninges not become implicated in the disease. Thus the three individuals, whose cases have been just narrated, had no more advanced disease, than tuberculous or gray granulations, in the lungs; and of thirteen others, children or adults, whose cases I have analysed with this point in view, two only had a small cavity in one of the lungs, and three, some inconsiderable ulcerations in the small intestine.

We should, however, deceive ourselves, did we imagine, guided by the evidence of the preceding cases, that the diagnosis of tuberculous meningitis is always so easy a matter, and that it is impossible to confound it with any other affection. The following case, which fell under my observation at the Hospital Beaujon, and was reported with much care by M. Cossy, shows that, in the adult as in the child, the diagnosis of the disease in question may, in some cases, be extremely difficult.

Case XXVIII. A messenger and light-porter, aged 22, a native of Savoy, of ordinary height and fulness of person, with chesnut-coloured hair, of rather strong constitution, and healthy coloured skin, was brought to the Hospital Beaujon on the 6th of August, 1840. Living in Paris for the last five years, committing no excesses, occupying a well-ventilated room, and in the habit of taking nutritious food, he had invariably enjoyed good health during the lapse of time mentioned, with the exception of some slight headaches, which returned at distant periods, when, on the 31st of July, 1840, he was seized with violent pains in the forehead, accompanied with sensation of lassitude and general uneasiness. All this, however, did not prevent him from eating his supper, though he did so with less than his usual appetite. He passed a sleepless night. On the following morning, the headache had increased still further, and the patient on sitting up in his bed previously to rising for the day, as he intended, was seized with giddiness which obliged him to lie down again immediately. The same symptoms continued the following days; restlessness without delirium occurred in the night. The patient meanwhile kept his bed, continued to eat with some appetite, and had, every day, two or three stools with all the characters of perfect health. He was brought in a coach to the hospital on the 6th, not having at that period experienced any symptom connected with the organs of the senses.

7th. Face looks somewhat bloated, not deficient in colour, but has some slight expression of indifference; intellectual faculties in good condition; answers correct, memory good; frontal headache as before, generally constituted by sensation of weight, sometimes by lancinating pain; eyes red, affected

with chronic inflammation for nearly a year; sight indistinct, as it has been during this last-mentioned period; frequent giddiness when the patient raises himself; tongue tolerably moist, covered with a whitish fur; thirst and appetite moderate; abdomen free from pain, natural in shape and yielding; urine passed naturally. From time to time, for the last two or three days only, the patient coughed a little; the chest, broad and well shaped, furnished a very clear sound under percussion in every direction; posteriorly, sonoro-sibilant rhonchus was audible from base to summit. Pulse 72, regular, and without any particular character; skin hot and dry. Neither nausea, vomiting, nor gurgling in the abdomen; nor buzzing in the ears, nor lenticular pink maculæ on the skin; nor epistaxis.

Lemonade twice; half a bottle of Seidlitz water; low diet.

Five stools between the day and night. On the 8th, the expression of indifference in the face was more strongly marked than on the previous day; pulse 70; the rest as before.

Pergat.

At six o'clock in the evening, the patient had had five stools; the skin was burningly hot and dry; pulse as in the morning, and rather full; frequent giddiness when he goes to stool; slight delirium in the night.

9th. The delirium ceased in the morning; the headache relapsed to its former severity; intelligence a little duller than usual; pulse 78, tolerably full and regular.

Lemonade twice; low diet.

Two liquid stools in the course of the day; great restlessness at night.

10th. Countenance as before; headache of moderate violence, still in the same place; abdomen and chest as on the first day, cough rare; hearing quick; no buzzing in the ears; neither epistaxis; nor lenticular pink maculæ on the skin.

Lemonade twice; half a grain [3 *centigrammes*] *of extract of opium; low diet.*

11th. As before. 12th. In the morning (after a quiet night) slight somnolence; dislike to speak; face red; skin very hot; pulse 86, tolerably full and still regular.

Pergat.

Delirium reappeared the following night; and on the morning of the 13th, the face was without expression; almost con-

stant stupor, from which he is, however, easily roused; prostration of strength increased; hearing dullish; no buzzing in ears; complete failure of appetite; no nausea, no vomiting; abdomen natural in shape, and free from pain; pulse 100, tolerably full; one semi-liquid stool; no lenticular pink maculæ, nor sudamina.

Pergat.

In the evening, the delirium reappeared; alternately restlessness and somnolence, the patient constantly desiring to leave his bed, so that the strait-waistcoat became necessary. In the morning of the 14th, the face was red and devoid of expression; deep sighs from time to time; he does not speak, but understands what is said to him, as he puts out his tongue when asked to do so. Tongue moist; abdomen somewhat tense in every direction; stools abundant and liquid, and since yesterday passed in bed, like the urine; pulse 100, regular, tolerably full; skin very hot and dry.

Lemonade.

In the evening, skin as at last report; pulse 110; the patient previously appearing to have no consciousness of what was going on around him, addressed me abruptly, opened his eyes, and said he suffered from his head. The delirium ceased at about two o'clock, and he had a tolerably quiet night.

15th. Marked expression of indifference in the face; considerable somnolence; the patient understood, but exhibited great repugnance to answering, questions; the headache continued; tongue dry in the centre; abdomen tympanitic; stools and urine involuntary; cough rare; pulse and skin as yesterday evening.

Pergat.

Restlessness so great in the night, as to make it necessary to put on the strait-waistcoat.

16th. Deep stupor; eyes closed; abdomen somewhat tense, without being altered in shape; stools involuntary; respiration 36; pulse 128, small, regular; skin warm, and covered with perspiration; no eruption of any kind.

The patient expired at seven o'clock p.m., while M. Cossy was taking notes at his bed-side. The skin which had been smooth a moment before, became suddenly pale, and acquired the appearance of the *cutis anserina;* the pulse, which had been till that moment perfectly distinct, ceased to beat quite suddenly; and the suspension of respiration took place in the same way.

Sectio Cadaveris; *thirty-eight hours after death.*

External appearances. The entire surface of the body is of violet colour, particularly posteriorly, where likewise mottling exists to a very considerable amount. The parietes of the abdomen exhibit a slight greenish tint; considerable cadaveric rigidity; body well supplied with fat; muscles massively developed.

Head. Scalp gorged with blood, especially posteriorly. Anteriorly, the dura mater exhibits, on the right and left of the longitudinal sinus, five tumours, from two and a half to three lines [5 to 6 millimeters] high, and from four and a half lines to an inch and two lines [1 to 3 centimeters] broad at the base. This membrane is perforated in a great number of places opposite these tumours, which result from the agglomeration of a multitude of little bodies of the size of a pin's head, whitish in colour and friable, springing from the arachnoid and pia mater, which exhibit a yellowish colour around them. The convolutions present a similar prominence in the corresponding places, produced by remarkable thickening of the cortical substance; while the white substance is perfectly natural. The pia mater investing the rest of the convex surface of the hemispheres is infiltrated with yellowish opaline liquid, and is thicker and more resisting than in the natural state; it presents, too, especially, on the convolutions, roundish, whitish, friable bodies, of small size, and in every way similar to those just described. The mem-membranes of the base of the brain contain the same productions; the granulations are more numerous in the fissure of Sylvius than anywhere else, except in the choroid plexuses. The lateral ventricles contain a good quantity of lemon-coloured transparent serosity; septum lucidum in great part destroyed; corpora striata and optic thalami excessively softened; the softening ceases imperceptibly in the centrum ovale on either side. Cerebellum and medulla oblongata present nothing remarkable.

Chest. Left lung perfectly free from adhesions; the right, on the contrary, adherent over the entire surface by cellular bands; both organs of large size, heavy, of violet colour, and studded over their entire surface with a great number of whitish, opaque, rounded bodies, of half a line and one line [1 and 2 millimeters] in diameter, developed underneath the pleura, and giving the surface of the lung a mammillated aspect. Similar granulations existed throughout the entire substance of the lungs, presenting

in every situation the same size and appearance. Both lungs were generally engorged. At the root of the right bronchus, but not pressing upon it, appeared an ovoid tumour, of the size of a small hen's egg, composed of a fibrous cyst divided into four compartments, and filled with a yellowish, smooth, homogeneous matter, soft to the touch, and of tuberculous appearance. The right pleura contained a few drops of transparent serosity, and exhibited on its diaphragmatic division numerous fragments of pseudo-membrane, arranged in the form of patches, from half a line to a line [1 to 2 millimeters] thick, reddish, almost semi-transparent, and containing in their substance whitish granulations like those found in the meninges.—About two tablespoonfuls of lemon-coloured serosity in the pericardium; heart in the natural state.

Abdomen. Nothing remarkable in the peritoneum. Stomach rather lax; sub-mucous cellular tissue, especially of the posterior surface, emphysematous. Mucous membrane healthy.—Two invaginations of the central part of the small intestine, easily unfolded; mucous membrane healthy, with the exception of an erosion, about as large as a sixpence, at about an inch and two lines, or an inch and a half [3 or 4 centimeters] distance from the ileo-cæcal valve.—Mucous membrane injected to various degrees; otherwise natural.—Spleen large, four inches and five lines [11 centimeters] long, extremely soft, diffluent indeed; its tissue containing a vast number of very small white granules, easily removable with the point of a scalpel.—Kidneys gorged with black blood.—Liver and gall-bladder natural.

It would perhaps be difficult to adduce a case more replete with interest and instruction than that just narrated. On the one hand, in truth, the course of the disease was that of the acute class; on the other, the phthisical affection ran a completely latent course; and the tuberculous meningitis for these reasons must almost inevitably have been confounded with a much less dangerous malady—typhoid fever. As in the latter disease, so in the case before us, headache of some intensity marked the outset, accompanied with considerable prostration of strength, marked sinking of the features, giddiness with dazzling before the eyes, and shortly afterwards delirium by night. These symptoms continued; the delirium and stupor increased; the pulse

became gradually more and more frequent; the skin excessively hot and dry; and the stools involuntary. Further, as is so common in typhoid fever, slight cough came on on the third or fourth day of the disease, and on the sixth, sonoro-sibilant rhonchus became audible all over the chest. The patient was only twenty-two years of age. Observe the number of reasons for believing in the existence of typhoid fever. It is true that at no period of the disease were there lenticular pink maculæ of the skin, sudamina, buzzing in the ears, nor tympanitis; and the character of the countenance had more affinity to that proper to meningitis than to that observed in the course of typhoid fever. Still the diagnosis, it must be admitted, presented serious difficulty; inasmuch as some of the symptoms deficient in the case have been similarly wanting in certain instances, where the fact of the disease being typhoid fever has been verified by post-mortem examination. It might further be supposed, that in the present case the disease was none other than central softening of the brain.[1] This alteration of structure which, it is true, existed here, was in all probability developed subsequently to the arachnitis; while this latter had certainly commenced at least sixteen days before the patient's death, and for this reason had the chief agency in generating the symptoms observed. Another circumstance still further increasing the difficulty of the diagnosis was the complete absence of nausea and vomiting, symptoms so common in the course of tuberculous meningitis. But the affection, which it was not only very difficult, but absolutely impossible, to recognize during life in this case, was the tuberculous condition of the lungs. In truth, what had we to guide us to the detection of that disease in an individual who had not coughed at all before the invasion of a malady of obscure character,—who coughed very little when cough did set in,—whose chest was perfectly sonorous, and respiration free from rhonchus, with the exception of the sonoro-sibilant variety which does not appertain to tubercles,—who had not spit blood,—and whose fulness of person testified to the recency of the malady under which he laboured? It must then be admitted that the diagnosis of tuberculous arachnitis may in some cases, even in subjects who have passed their twentieth year,

[1] See my Recherches anatomiques, pathologiques et thérapeutiques sur la Fièvre typhoïde. 2ème éd. Paris, 1841.

present the greatest difficulty; and that to overcome this difficulty is not always within the power of the most attentive and scrupulous observer. I may add, also, that if in such cases diagnosis of phthisis could be made out at all, this could only be done after the detection of the meningitis.

SECTION XVII.—FUNCTION OF HEARING.

The function of hearing, like those of the organs of sense generally, was usually unaffected in tuberculous subjects, until the closing period of life. I did not note any case of deafness, or even dullness of hearing, in consequence of the development of tubercles, in the one hundred and twenty subjects whose histories are the special material of our present study. But within the last fifteen years I have observed a certain number of cases, both in hospital and in private practice, in which deafness, sometimes to a very considerable amount, existed in tuberculous subjects. According to M. Ménière, who drew my attention to the point, the most common cause of the symptom is the more or less complete destruction of the membrane of the tympanum—a condition no doubt resulting from the development of tuberculous matter in its substance.

I have quite recently met, in private practice, with two young women, aged under twenty-five years, and affected with almost complete deafness, in the course of tuberculous disease of the lungs, which had lasted less than a year. Without pretending to give the proportion of phthisical cases in which hardness or loss of hearing occurs, I am justified in believing that the occurrence is not very excessively rare. I have another example of the fact under observation at this moment, at the Hospital Beaujon, in the person of a man, aged thirty, who has coughed for the last year, and, in less than two months, lost the faculty of hearing.

Far from feeling any astonishment that the tuberculous affection may implicate the ear, we should rather, inasmuch as tubercles originate in all the tissues, be surprised that this organ escapes so frequently as it does. It is quite possible, too, that tubercles would, from time to time, be found in the membranes of the eye, and examples of blindness thus produced discovered,

did the eyes of phthisical patients attract the attention of observers more than they habitually do, during life and after death.

SECTION XVIII.—EMACIATION.

Loss of flesh set in, in one half the cases, with the earliest symptoms of the disease,—and this whether the malady ran a rapid or slow course, whether it proved fatal, for example, in five months or three years. In a small number of cases, emaciation commenced at the same time as diarrhœa, or loss of appetite, although the mucous membrane of the stomach was, in several instances, perfectly healthy, or although any changes it exhibited were recent at the period of death. In one third of the patients it did not commence until fever had set in. Hence the inference that, in the majority of cases, it could not be ascribed at its commencement either to diarrhœa, loss of appetite, or morbid changes in the mucous membrane of the stomach, and that its first cause must be looked for in the influence exercised by the disease of the pulmonary parenchyma in interfering with the process of nutrition. Diarrhœa once established, the emaciation made rapid progress; morbid states of the mucous membrane of the stomach also played an important part in its production. And, as a general fact, unless some disease of the brain, or some special phenomenon—perforation of their pleural investment, for example, occurring in the lungs themselves, cut short the course of the disease, the patients died in the last stage of marasmus.

Emaciation is capable of supplying the observer with some useful hints in respect of diagnosis in cases of latent phthisis; that is to say, when patients, without experiencing the local symptoms of phthisis, are tormented by more or less violent fever of long standing, accompanied with oppression of breathing, and loss of flesh. It is, in truth, rare under such circumstances, that the lungs are not the cause of the phenomenon, and that the affection of those organs causing it is not tuberculous. Hence an additional motive, in such cases, for having recourse to all methods capable of disclosing the condition of the lungs with accuracy.

The emaciation implicated in an obvious manner almost all

the tissues. The cellular tissue eventually disappeared almost completely; the skin itself underwent attenuation. Nor was the bulk of the muscles less diminished; that of the heart has already been considered, but, in the instance of the voluntary muscles, the fact was still more obvious. Of these the flat muscles, the temporal, those of the thoracic parietes, &c., had, in the majority of cases, lost upwards of two thirds of their natural bulk. The muscular tunic of the stomach often appeared to me to be attenuated; the dimensions of the uterus had evidently decreased in many cases, &c. &c.

SECTION XIX.—SYMPTOMS OF PERFORATION OF THE PARENCHYMA OF THE LUNG, PRODUCED BY BURSTING OF A TUBERCLE INTO THE CAVITY OF THE PLEURA.

This species of perforation, to which attention was drawn by Laennec, presents itself under two principal forms. In one of these the tuberculous excavation, opening into either pleura, obviously communicates with the bronchi; whereas in the other, this communication can only be shown to exist by means of insufflation. In one and the other case, the moment of perforation is marked by symptoms so severe and striking, that their having escaped such attentive observers as Bayle and Laennec is matter for most legitimate surprise. In order to place the importance of these symptoms in a diagnostic point of view out of the reach of doubt, I shall commence by relating several cases, —and then pass to the consideration of the other symptoms of perforation of the lungs, which, as they do not at first strike the observer in the same obvious manner as the others, require to be looked for with more or less care.[1]

Case XXIX. A man, aged 36, of small stature and violent

[1] The first four cases related in this section form the groundwork of the Essay which I published in the fifth volume of the Archives de Médecine, entitled, *Observations relatives à la perforation du parenchyme du poumon, &c.* Those which I have collected since the publication of that Essay having corroborated the conclusions drawn therein, I have scarcely made the smallest alteration in the present place, simply indeed introducing some details, purposely left out in the cases, and giving them the form adopted in the course of this work.

temper, was admitted into the Hospital of La Charité on the 16th of September, 1822. He had been a few days only discharged from the prison of Poissy (having been confined as a criminal for five months), where he had, soon after his arrival, contracted a *cold,* which had subsequently made continual progress. Loss of flesh set in simultaneously with the cough, and, for the last two months, the patient had rigors daily, pain at the epigastrium, and frequent liquid stools. Three days before his admission into the hospital, he had been seized *suddenly,* after a fit of vomiting, attributed to the vapour of charcoal, with violent pain in the left side of the chest, accompanied with sense of suffocation, and extreme anxiety: these symptoms had continued with their primitive severity for twenty-four hours, and then undergone slight diminution. On the third day of their existence, the patient, who lived not more than three hundred steps from the hospital, came there on foot, but took about an hour and a half to the walk. On the day following his admission, as the pain and anxiety continued to a considerable amount, twenty leeches were applied to the painful side.

19th. *Present state.* Face pale, and expressive of fatigue; respiration deep and frequent; orthopnœa; severe pain; percussion very sonorous over the whole of the left side of the chest, more so even than on the other side; intercostal spaces widened; no respiratory murmur heard on this side, either during inspiration or expiration; no metallic tinkling; cough rare; sputa nummulated; pulse 120; pulsations of heart scarcely audible in the precordial region; mouth clammy; thirst urgent; appetite almost completely gone; epigastrium painful under pressure (as it has been for the last two months), with a sensation of weight there after meals.

V. S. to ten ounces [300 *grammes*]; *ptisan of violets, with syrup of gum; gum potion; julep.*

20th. Symptoms very much as before; whence another application of leeches to the left side, which was nine lines [18 millimeters] wider than the right. On the 21st, a blister was applied to the side.

25th. Pulse fallen to 92; dyspnœa variable, sometimes excessive; decumbency as on the first day; prominence of the left side still further increased; results of percussion and auscultation as before.

There were only slight variations in the symptoms the following days; and in consequence of the indocility of the patient, auscultation was not practised again till the 5th of October. On that day a confused murmur was audible in the upper fourth of the left side of the chest,—with metallic tinkling opposite the lower angle of the scapula, when the patient spoke. Here, and lower down, the sound on percussion was dull; it was extremely clear anteriorly, where there was no metallic tinkling; the pain had disappeared; the left arm was œdematous.—7th. Metallic tinkling audible six inches [15 centimeters] below the axilla, and over almost the entire of this side posteriorly.—On the 8th it was manifest immediately below the axilla.—On the 13th it existed in the same region, and opposite the mamma; below this the chest emitted no sound on percussion.—On the 20th, the day before death, the chest was very sonorous between the clavicle and mamma, and metallic tinkling had ceased to be audible anywhere.

The cough was not troublesome; the expectoration not abundant; the sputa were sanious on the 21st, resembling the matter frequently found in tuberculous cavities. The patient sat up almost constantly in his bed.

Frequent alternations of anorexia and of returning appetite were observed; the epigastrium continued invariably painful under pressure; the lightest kinds of food, soups, &c., caused a distressing sensation of weight there; the bowels acted with greater or less frequency; the perspiration was inconsiderable; the loss of strength daily on the increase.

The œdema of the left arm continued to the end. On the 8th, erysipelas declared itself at the bend of the elbow, and went through its periods as in the simple form. On the 18th, slight redness and swelling of the thighs were noticed, and on the following day these appearances had become more obvious. On the 21st, decomposition of the features set in; and death took place at 3 p.m., thirty-three days after the invasion of the symptoms of perforation.

Sectio Cadaveris; *seventeen hours after death.*

External appearances. Considerable œdema of the lower extremities, especially of the left, where the inguinal glands were redder and larger than on the right side. Skin of the left arm still somewhat red in the place which had been the seat

of the erysipelas during life; here the skin was about a line [2 millimeters] thick, and immediately underneath lay a firm concrete layer of pus, more than half an inch [12 millimeters] thick, as it were deposited in the midst of the infiltrated serosity.

Head. A moderate amount of serous infiltration under the arachnoid; three small spoonfuls of serosity in the lateral ventricles; nothing else remarkable.

Neck. Superficial ulcerations, an inch and two lines [3 centimeters] long, and half an inch [$1\frac{1}{2}$ centimeters] broad, in the lower part of the fleshy portion of the trachea.

Chest. On the left side, about seven pints [4 litres] of greenish pus, free from smell, surmounted by a small quantity of air; the lung presents some cellular adhesions at the apex, and was covered elsewhere by a pseudo-membrane, which likewise invested the diaphragmatic and costal pleuræ. Flattened against the vertebræ, the organ measured about four lines [8 millimeters] in breadth, in the thickest part, and presented posteriorly, opposite the angle of the third rib, a rounded orifice, measuring four lines [8 millimeters] in diameter,—the orifice of a canal of the same width, nearly two inches [$4\frac{1}{2}$ centimeters] long, into which one of the principal divisions of the bronchi opened. This canal was lined with a thin pseudo-membrane, lying either on tuberculous granulations, or on healthy pulmonary parenchyma, and was evidently an altered form of a larger cavity, which had gradually contracted under the pressure exercised by the air and pus contained in the pleura. There were some other small cavities partly empty at the apex of this lung, and throughout the remainder of its substance, gray semi-transparent granulations in abundance.—The right lung presented a depression at its upper part, corresponding to a mass of semi-cartilaginous matter, surrounded with dry black-coloured substance, and some tubercles in a state of suppuration. Mucous membrane of the bronchi of bright red colour.—Nearly an ounce [about 30 grammes] of serosity in the pericardium: heart and aorta healthy.

Abdomen.—Stomach moderately distended by a viscous liquid; mucous membrane very soft in the fundus, where it presented some red spots; elsewhere of proper consistence and thickness; it was destroyed over a surface measuring seven inches [18 cen-

timeters] in the lower part of the fundus, and the corresponding cellular tissue had in some places disappeared.—There were three large annular ulcerations in the lower fourth of the small intestine, and between these many others of very small size, with tuberculous granulations, several of which were ulcerated on the most prominent parts.—Mucous membrane of the large intestine softened throughout its entire extent; a few ulcerations in the ascending colon.—Liver and pancreas natural. Spleen of large size, and easily broken up into detritus.

Case XXX. A mantua-maker, aged 45, of tolerably strong constitution, although always subject to laborious digestion had been fifteen months ill, when admitted into the Hospital of La Charité, on the 4th of June, 1824. The affection had commenced with cough, expectoration, and rather copious hemoptysis, which lasted eight days, and had recurred pretty frequently, more especially during the last four months. From that time there had been marked dyspnœa; the patient had frequent attacks of pain in the sides of the chest, almost continual rigors and perspiration, lost flesh and all appetite, and vomited everything she took. During the last three months pain at the pit of the stomach, frequent attacks of colic, and stools frequently of mucous and sanguinolent character, had supervened. She had not kept her bed, nor ceased to work.

June 9th. *Present state.* Moderate emaciation; skin of a somewhat yellowish tint: headache; pains in the limbs; frothy, white, and greenish sputa, not quite opaque; under the left clavicle, where there had been almost constant pain for the last three months, the chest emitted no sound on percussion; tracheal respiration, and perfect pectoriloquy over a surface measuring six inches [15 centimeters] from above downwards; some gurgling audible lower down; on the right side the respiration appeared natural; appetite feeble; tongue moist, and of good colour; cold drinks cannot be borne by the patient; epigastrium very tender under pressure, presents a state of tension which continues along the right false ribs.

Infusion of polygala with syrup of gum; julep; three rice creams.

The succeeding days rather profuse diarrhœa came on; and from the 18th to the 20th, continual nausea, with complete loss of appetite. The patient had in consequence a mucilaginous

mixture with syrup of poppies, and on the third day of its administration, the symptoms abated, the appetite returned, and the diet was soon increased to one quarter of the house-allowance, without producing any other inconvenience than slight sense of weight at the epigastrium; results of percussion and auscultation very much the same as on the first day.

July 20th. At 11 o'clock in the morning, while the patient was in a state of quietude, she was seized with *pain near the lower angle of the right scapula,* at first of moderate severity, afterwards becoming, *suddenly,* excessively violent, and attended with a feeling of suffocation, anxiety, continual cough, and orthopnœa. These symptoms continued with the same severity during the night; and the pain frequently appeared to spread as it were from the back, over the entire chest, as far even as the umbilicus, again returning to its place of origin.

21st. Respiration 52, exceedingly laborious; the patient complained of suffocation, and of being uneasy in every posture; the expression of the face was changed, without, nevertheless, exhibiting the marks of excessive suffering; pain in the back acute, and the gentlest percussion on the right side of the chest insupportable; percussion here furnished a clear sound, much clearer even than in the most sonorous point of the left side; no respiratory murmur audible there, except in the postero-superior region; no metallic tinkling. Pulse 128, regular, extremely small and weak; continual palpitation.

The same phenomena continued; the anxiety increased even; the results of auscultation underwent no change; and after the most agonizing sufferings, occasionally interrupted by brief stupor, the patient expired at noon on the 23d, three days after the outset of the pain in the back.

Sectio Cadaveris; *twenty-eight hours after death.*

External appearances. Nothing remarkable; second stage of marasmus.

Head. A few glands of Pacchioni on the edges of the longitudinal fissure; with considerable sub-arachnoid infiltration; cortical substance of the brain slightly pinkish.

Neck. Larynx and trachea natural.

Chest. An incision having been made into the right side of the chest, some gas, devoid of smell, escaped with a whistling noise. The dorsal portion of the pleura was invested by soft

pseudo-membrane; the cavity contained nearly four ounces [120 grammes] of turbid serosity. The lung occupied somewhat less than a third of the cavity of the pleura, and an extent of about three inches and seven lines [9 centimeters] of its surface, and adhered to the surrounding parts by means of a semi-cartilaginous pseudo-membrane, half a line [1 millimeter] thick. Immediately below this adhesion, and posteriorly, a rounded orifice, measuring three lines [6 millimeters] in diameter, and opening into a small cavity, was discovered; the cavity was lined with a very thin pseudo-membrane, lying upon healthy pulmonary tissue. This small cavity did not obviously communicate with the bronchi, nor with an excavation of very large dimensions placed higher up, and lined with a double pseudo-membrane, the inner layer soft, the outer semi-cartilaginous. The lower three fourths of the lung only contained a few semi-transparent gray granulations.—The upper half of the *left* lung adhered to the costal pleura, and contained a large cavity at its apex, communicating with others of much smaller size, and with the bronchi; it likewise presented in its upper two thirds a multitude of gray granulations, in the midst of a slightly yellowish, moist, semi-transparent, firm, homogeneous matter, totally devoid of air. The rest of the organ red and hepatized. Bronchi of bright pink colour.—Pericardium contains nearly two ounces [60 grammes] of serosity; heart healthy.

Abdomen. Liver of large size, uneven on the surface, deeply furrowed to the right of the suspensory ligament; somewhat red, at its large extremity more especially; it overlapped the stomach, and descended almost as low as the umbilicus. Stomach contracted; its internal surface, almost completely covered with glairy matter, presented a white patch, of fourteen inches [36 centimeters] in superficial extent, near the cardiac orifice, where the mucous membrane was extremely thin, pale, and as soft as mucus; whereas all around it was mammillated, pink coloured, and thickened to the right, very much attenuated and very red to the left. Near the pylorus were several red bands, an inch and two lines [3 centimeters] long, and three lines [6 millimeters] broad, where the mucous membrane was thin and sunken.—Mucous membrane of the small intestine, somewhat red and injected, of proper thickness and consistence;—that of the colon red and softened, presents small ulcerations.

Case XXXI. A woman, aged 32, of large stature, and strong, was admitted into the Hospital of La Charité, on the 11th of September, 1823. She had coughed and expectorated without interruption for eleven months, had had several attacks of hemoptysis, frequent pain between the shoulders, rigors followed by heat and perspiration, and from the commencement of the cough, pain at the epigastrium. The breathing had been oppressed for a long time.

12th. Face animated; headache; speech somewhat short; occasional aphonia; posture natural; respiration natural, except on the right side, superiorly, and behind, where it was somewhat tracheal; dyspnœa moderate in amount; sputa greenish; no pectoriloquy; pulse slightly more frequent than natural; skin rather hot; tongue clean and moist; appetite failing; epigastrium painful under pressure; bowels constipated.

Infusion of Iceland moss; pectoral ptisan; gum potion, with syrup of poppies; emollient enema; one eighth of house-allowance.

From that period till the 20th of December, the day on which she expired, the following were the phenomena observed.

From the commencement of October, the patient complained of feeling great heat between the shoulders; the voice resounded, and the respiration was tracheal in that situation, as also under the two clavicles, more especially the right; the chest sounded well over its entire surface; sputa puriform.—December 4th. Doubtful pectoriloquy between the shoulders and under the left clavicle; gurgling over a surface seven inches [18 centimeters] in extent in the latter situation.—On the night of the 19th, rather sharp pains in the back. 20th. In the morning, they had greatly diminished, and the breathing was not obviously more laborious than usual. During the night, however, *violent and sudden pain* was felt along the spine, accompanied with a sensation of suffocation and anxiety. On the following morning the patient was found in the sitting posture in bed, spoke only of her pain and dyspnœa, and laid great stress upon the *sudden* occurrence of the former; features decomposed; chest more sonorous on the left side posteriorly and laterally, than on the right; instead of respiratory murmur, a sort of mucous rhonchus, which appeared to traverse an empty space before reaching the ear, was audible; no metallic tinkling; nor was any particular sound perceived, when the patient was first laid down,

and then suddenly raised to the sitting posture; respiration extremely frequent; continual restlessness. The patient died at 10 p.m., the same day, after enduring inexpressible suffering.

The skin was constantly more or less hot, and perspiration to a considerable amount occurred during the nights. Aqueous infusion of bark, taken in the dose of two cupfuls daily, for nearly two months, produced no effect upon the latter.

At the beginning of October, the appetite was slight, the mouth bitter tasting, the tongue whitish: vomiting occasionally occurred in the midst of a fit of coughing. The same vomiting existed, the appetite had failed still more, and the tongue was in the natural state on the 4th of December. On the 10th, the thirst had increased; the lightest drinks caused a sensation of great weight at the epigastrium; and, for some days, there had been troublesome diarrhœa.

Emaciation advanced rather rapidly, and from the 4th of December the left arm was œdematous.

Sectio Cadaveris; *thirty-four hours after death.*

External appearances. Œdema of the left arm; nothing else remarkable.

Head. Three small spoonfuls of serosity in the lateral ventricles of the brain; the rest healthy.

Neck. Trachea and larynx natural.

Chest. On incision, a very small quantity of gas escaped from the left side, which contained likewise upwards of five pints [about 3 litres] of sanguinolent serosity, free from albuminous flocculi. A layer of soft pseudo-membrane, of crimson colour, and quarter of a line [half a millimeter] thick, invested the lungs and the corresponding thoracic walls in their entire extent. This lung was closely adherent at its apex, over a surface two inches and three quarters [7 centimeters] high, to the neighbouring parts; and almost immediately below this adhesion and posteriorly was a rounded orifice, as large as a pea, communicating with an extensive cavity, itself containing a very small quantity of liquid grayish-coloured matter, some of which was found on the diaphragm; this cavity communicated with the bronchi. The upper five sixths of the lung were transformed into a firm grayish semi-transparent matter, studded with a great number of tubercles and small cavities; the latter communicated with each other, and were only separated from the pleural cavity in some

places by substance less than half a line [1 millimeter] thick; the lower sixth of the organ crepitated under pressure. The bronchi were of a delicate pink colour. There were some cavities at the apex of the right lung, and unsoftened tubercles at its base. Heart healthy; one third smaller than in the natural state. Aorta of a bright red colour throughout.

Abdomen. Stomach larger than usual; mucous membrane tinged of a pale pink colour in some places; mammillated anteriorly, and over a considerable extent of the fundus; it presented, in these regions, ulcerations of a superficial extent of from three to six lines [6 to 12 millimeters], and was elsewhere of proper thickness and consistence.—The small intestine contained a great deal of mucous matters; the mucous membrane pale and firm; some of the patches of Peyer in the lower fifth ulcerated.—Mucous membrane of large intestine pale; ulcerations diminishing in number the nearer the rectum the examination is made; only one in the latter portion of bowel.—Liver softish, easily torn; bile in the gall-bladder not thick, and of tolerably deep colour.—Spleen somewhat softened.—Cortical substance of the kidneys much redder and moister than usual. —Pancreas harder than natural.—Uterus healthy.

Case XXXII. A woman, aged 26, not of strong constitution, and of very acute sensibility, was admitted into the Hospital of La Charité on the 15th of November, 1823. She had been losing flesh for upwards of two years, and ascribed this to severe mental affliction. She was scarcely prone to catch colds, had coughed and expectorated without interruption for the last five months; had, during the first fortnight of the chest-affection, fever, pain in the head, and much difficulty of breathing; the sputa had occasionally been bloody. Subsequently, these symptoms became much less severe. For the last six weeks this patient had almost completely lost her appetite, was tormented by frequent attacks of colic-pains, and had fits of rigors, followed by heat and perspiration during the night.

November 16th. *Present state.* Face rather animated than otherwise; loss of strength rather marked; second stage of marasmus; voice weak and husky, as it has been for the last two months; cough frequent; sputa greenish, inclining to the nummulated form; respiration weaker in the upper half of the left

than of the right side; elsewhere natural; no resonance of the voice or pectoriloquy anywhere; skin not very hot; pulse 100; yesterday, at eleven o'clock, (as on the previous days also,) rigors followed by heat; tongue somewhat red at the edges, villous and yellowish in the centre; appetite gone; epigastrium yielding; right flank tense, without obvious tumour to cause this; bowels regular.

Pectoral ptisan; Iceland moss; quarter of house-allowance.

The febrile paroxysms became so distressing to the patient that an attempt was made to suppress them by means of sulphate of quinine; but in consequence of the general uneasiness, vertigo, buzzing in the ears, and epigastric pain, &c., which followed its administration, it was given up on the 27th. The rigors had by that time disappeared; but the paroxysms of heat continued with greater or less violence at the accustomed hour.

December 4th. Tracheal respiration under the left clavicle; bowels constipated; almost complete anorexia; rigors returned. The following days the cough brought on nausea; and profuse diarrhœa succeeded to the previous state of constipation.

January 1st. In the night the patient *suddenly* experienced, on the left side of the chest, a sensation such as would have been produced by gas circulating from below upwards, through the entire of that part of the chest. At the same time the respiration became exceedingly laborious; the patient was frequently on the point of fainting. Almost immediately afterwards, very acute *pain* was felt behind the left breast. The following morning this pain continued; the respiration was much more frequent than usual; the patient could only lie on the right side, and laboured under much general uneasiness; the sensation like that of air moving in the left side of the chest had disappeared. The left side of the chest emitted a sound, as clear as that of a drum, under percussion; neither respiratory murmur nor metallic tinkling was audible there; voice extinct; pallor of face and lips; patient threatened with syncope whenever she attempted to sit up in bed; pulse 116, small and weak.

I noticed the state of the respiration with care, until the 16th of January, with the following results:—4th. A very feeble respiratory murmur audible near the left axilla, and some mucous rhonchus under the clavicle on the same side.—5th. Two inches and four lines [6 centimeters] below that bone, metallic tinkling

was heard with the voice.—7th, and following days, the tinkling became audible over a wider surface, both with the voice and with inspiration.—The pain grew worse and became exceedingly acute on the evening of the 10th, and required the application of some leeches for its relief.—11th. Oppression of breathing greater than usual; respiration very frequent, pain less severe; metallic tinkling as before in the lower three fourths of the chest; chest very sonorous, and respiratory murmur deficient in the clearest-sounding places.—Her state continued the same until the 16th.—On the 17th the dyspnœa increased much, the left side still emitting a very clear sound under percussion.—The patient expired on the 18th, without death-struggle (sans agonie), a few minutes after having expressed a desire to sleep.

From the moment that the existence of pneumothorax was ascertained, the patient invariably lay on her right side; the aphonia only disappeared from time to time; the cough was, generally speaking, not troublesome; the sputa greenish and nummulated; the pulse small, weak, and frequent. The patient retained her liveliness to a certain degree, and was not without hope of recovery. The appetite had almost completely failed; diarrhœa and constipation alternated with each other, and the first days following the occurrence of perforation, she vomited some mucus occasionally.

Sectio Cadaveris; *twenty-three hours after death.*

External appearances. Nothing remarkable; third degree of marasmus commencing. Brain and larynx not examined.

Chest. The left side resounded at its upper part only, and contained three hundred and sixty cubic inches [900 cube centimeters] of carbonic acid gas; the rest of this side, or about its three fourths, was almost completely filled with a turbid greenish fluid. The lung on this side was scarcely as large as two clenched fists, and adhered superiorly, over a surface two inches and four lines [6 centimeters] broad, to the costal pleura. Immediately below this adhesion, and posteriorly, was a rounded opening, with thin edges, and measuring two lines and a half [5 millimeters] in diameter, communicating with a cavity about the size of a moderately large apple. This cavity was anfractuous, and lined with a kind of tuberculous detritus, lying on a thin pseudo-membrane; it communicated, in several places, with the bronchi. Below the perforation were several yellowish spots,

marking the situation of tubercles in a state of softening, and ready to empty themselves into the pleura. The remainder of the lung was soft, free from air, and contained less tubercles the nearer it was examined to the base. The pleura was completely covered with thin pseudo-membrane, tolerably firm in its upper part; and its diaphragmatic portion smeared with about a tumbler-glassful of greenish matter, of jelly-like consistence.—The right lung exhibited some adhesions, a small cavity, and tubercles at the apex. Heart small; aorta perfectly healthy.

Abdomen. A moderate quantity of yellowish coloured viscid mucus in the stomach; mucous membrane of slightly-marked buff colour, mammillated nearly throughout its entire extent, of good consistence, partially destroyed along the lesser curvature over a superficial extent of four lines [8 millimeters.]—A great number of small ulcerations in the mucous membrane of the lower half of the small intestine; mucous tunic of bright red colour, and somewhat softened near the cæcum,—this condition affected a portion of the bowel measuring twenty-eight inches [72 centimeters] in length.—Mucous membrane of the large intestine as soft as mucus throughout; red and ulcerated in the ascending colon, shaded with red elsewhere. The liver protruded three fingers' breadth below the ribs, was of rather large size, buff-coloured, dotted with red points, of moderate consistence and somewhat fatty. Bile in the gall-bladder not high coloured or thick. The remaining abdominal viscera natural.

Case XXXIII. A clerk, aged 26, of small stature, but well made, with chesnut hair and well-developed muscular system, was admitted into the Hospital of La Charité on the 8th of November, 1824. From the age of 12 to 24 he had been employed in military service, and had during that period enjoyed good health; he now considered himself to have been eight months ill. He had coughed and expectorated during that period, and ascribed his *cold* to the bad arrangement of the office in which he was employed. The cough had increased considerably, and become paroxysmal, and the sputa grown thick for the last five months. In the course of the fourth of these months, he had suffered for fifteen days from rather sharp pains in the back, and within the last fortnight similar pains had supervened

in the left side. There was no fever at the outset; but for the last three months, the skin had been very hot in the evening, and profuse perspiration occurred every night; the appetite had not failed, and was even sharper for the last two months than before his illness; the bowels acted regularly. He began to lose flesh three months after the outset of the affection; and from that period ceased to follow his ordinary occupation.

November 9th. *Present state.* Strength considerably diminished; slight emaciation; trifling pain, from time to time, in the left side of the chest; breathing slightly oppressed; cough frequent and paroxysmal by night; sputa small in quantity, greenish, opaque, inclined to the nummulated form; respiration confused; mucous rhonchus; chest less sonorous than natural under the right clavicle; resonance of the voice in the corresponding spot posteriorly; respiratory murmur feeble on the left side and posteriorly; pulse not very frequent; heat of skin with profuse perspiration the preceding night; appetite continues; tongue clean; abdomen free from pain; bowels confined; the patient is in a state of tranquillity.

Decoction of Iceland moss; three quarters of a grain [5 *centigrammes*] *of opium in the evening; quarter of house-allowance.*

20th. Immediately under the right clavicle it appeared as if a small puff of air entered into the stethoscope with every word the patient uttered.

28th. Sputa somewhat tinged with blood; in the evening hemoptysis to the amount of about eleven ounces and a half [360 grammes] took place.—This continued with greater or less profuseness till the 8th of December, diminished from the moment the patient was given a mucilaginous mixture with about forty-five grains [3 grammes] of rhatany, and disappeared altogether on the third day of its administration. He had previously been let blood to the amount of from ten to eleven and a half ounces [300 to 360 grammes], and been given emulsions, without deriving the least benefit from either. During the first four days of the hemoptysis a crepitant rhonchus was audible on the left side of the chest,—general posteriorly, and limited anteriorly to the lower half of the thorax.

9th. Respiration almost perfectly natural on the left side; oppression of breathing increased; cough still severe at night; sputa white and greenish and nummulated; thirst moderate;

pulse calm; the appetite which had failed somewhat, began to improve; there had been no diarrhœa.

The general state of the patient continued very much the same till the 30th, and coughing usually brought on pain in the left side. On the 25th there was manifest pectoriloquy under the right clavicle, and a little crepitation in the lower half of the same side, a rhonchus which was nearly general on the right side: on the 28th it was audible only in the latter position: on the 31st the patient complained of suffering severely in the left side during the cough; in the evening this pain *suddenly* became excessively violent, and the difficulty of breathing extreme. The following day the patient continued to labour under intense dyspnœa and very great anxiety.—January the 2d, at seven o'clock in the morning, he was still in possession of full consciousness, and remembered perfectly well all that had occurred from the accession of the violent pain in the left side; but he saw indistinctly as through a cloud, the face was bathed in perspiration; the dyspnœa excessive; the respiration very frequent; the sound emitted by the left side anteriorly much clearer than of the right; neither respiratory murmur nor metallic tinkling were audible on the left side; suffocation seemed imminent, and the patient expired two hours after. The sputa were grayish coloured and disagreeable looking on this day, and formed a mass something like slightly viscid glue. Some pain was felt in the larynx.

From the 15th of December and upwards, he had hot-fits in the evenings, and perspired more or less profusely by night; just as before, he had no rigors. The thirst was not urgent, the appetite failed by degrees, and was eventually lost altogether. There was no diarrhœa till the closing five days of life.

Sectio Cadaveris; *twenty-three hours after death.*

External appearances. Shape of body almost unaltered; muscles thick, firm, and well coloured; first stage of marasmus.

Head. A small spoonful of serosity in each of the lateral ventricles; a tablespoonful of the same fluid at the base of the skull; the rest healthy.

Neck. Epiglottis and larynx natural. The mucous membrane of the trachea red, of proper consistence and thickness, presents immediately above the bifurcation two small triangular ulcerations covering a surface of from nine to fourteen lines [2 to 3 centimeters]; submucous tissue under them thickened.

Chest. Some gas, without any smell, escaped with a whistling noise, from the left side of the chest, when cut into. The lung on this side lay at a distance of from an inch and six lines to three inches and seven lines [4 to 9 centimeters] from the walls of the chest,—a distance increasing from the apex to the base. The organ was retained in its position by four whitish, thin, firm bands, uniting the pulmonary to the costal pleura. Its base and the corresponding portion of the diaphragm were covered with pseudo-membrane of slight consistence, reticulated in appearance, thick, and bathed by a reddish rather clear fluid, valued at nearly twelve ounces [360 grammes]. The upper lobe was invested by another pseudo-membrane, half a line [1 millimeter] thick, and semi-cartilaginous in structure; and at its lower extremity a yellow, round spot, one line [2 millimeters] in diameter, was discovered, corresponding to the situation of a softened tubercle, partially evacuated and burst into the cavity of the pleura. The opening was partly blocked up with a small quantity of tuberculous matter, and the cavity lined with a soft whitish thin pseudo-membrane; it did not communicate with the bronchi. At the central part of the same lobe, three cavities, like those already described, were found in the midst of healthy tissue; and towards the apex two other somewhat smaller cavities, of the size of a filbert, surrounded with grayish, highly indurated tissue; in which red, and considerably thickened bronchi terminated. The lower lobe was somewhat engorged, and contained a few semi-transparent granulations.—General adhesions, composed of dense cellular tissue, of the left lung; an extent of three inches and seven lines [9 centimeters] of the apex of the organ was indurated, and here were four cavities of the size of a cherry, filled with greenish pus and surrounded with grayish-coloured firm tissue. This tissue was traversed in every direction by white semi-cartilaginous or cellular septa, and yielded, when forcibly pressed, a small quantity of grayish fluid. Several bronchial ramifications, with reddened mucous lining and thickened walls, opened into these cavities. The lower lobe was somewhat engorged, and contained two or three tubercles, with some nodules, as large as walnuts, of hepatized tissue. The bronchial glands were of large size and gray colour, and perfectly free from tuberculous matter.—Heart and aorta healthy.

Abdomen. Stomach double the natural size, descended a little

lower than the umbilicus, and contained a good quantity of viscid mucus. The mucous membrane inclined to a violet colour at the posterior surface, and was less firm than on the anterior, where the colour had undergone no change.—The patches of Peyer, in the lower sixth of the small intestine, were more or less ulcerated, and exhibited several tuberculous granulations; the softening of which bodies appeared to have produced the ulcerations. Elsewhere the mucous membrane was perfectly healthy.—The ascending colon presented six grayish ulcerations of small size; the cellular tissue underneath some of these had undergone thickening, and in others disappeared; within the ulcerations in question were others of still smaller size. The mucous membrane of the entire of the large intestine slightly thickened and softened.—Mesenteric glands reddish and enlarged, free from tubercles.—Spleen pale coloured, and nearly double the natural size; the other viscera healthy.

Case XXXIV. A cabinet-maker, aged 42, of rather weakly constitution, but generally enjoying good health, and very rarely affected with colds, stated that he had never laboured under any complaint of the chest, but that which now induced him to seek advice at the hospital. He had been five months ill, and given up all work for two, without however keeping his bed. His illness had commenced without assignable cause, by cough of moderate severity, accompanied with clear expectoration; at the beginning of the fourth month oppression of breathing, and pain in the right side, sufficiently sharp to require the application of some leeches and a blister, supervened. The sputa had been very thick for the last three weeks, and for the last ten days the cough much increased in severity; the thirst became urgent, the skin burningly hot in the night, with profuse perspirations. The appetite had failed from the outset, and for the last three weeks disappeared wholly; emaciation had made great progress within the last two months. Neither diarrhœa, hemoptysis, nor rigors had occurred.

January 4th, 1825, (the day after the patient's admission.) *Present state.* Face pale; considerable emaciation; loss of strength; cough not very frequent; a moderate amount of oppression of breathing; decumbency various; sputa greenish, opaque, and non-striated; chest less sonorous on the right than the left

side, particularly posteriorly, and laterally, in the lower half of the chest; here indeed there was scarcely any sound at all; respiratory murmur feeble, mingled with mucous rhonchus almost all over this side; respiration tracheal, pectoriloquy all round the apex of the right lung, less obvious on the left side between the shoulder and spine; almost complete aphonia for the last two months, unaccompanied by either pain, dryness, or heat, in the larynx or trachea; pulse small, weak, and frequent; tongue moist, whitish in the centre; mouth clammy and bitter; anorexia, without thirst; epigastrium tender under pressure; nausea occasionally, during the cough; three stools, without colic pains, the previous day; the patient is tranquil, and suffers from no pain.

No obvious change occurred in the symptoms the following days; the larynx and trachea continued free from pain, and even from tenderness under pressure. On the 10th the patient complained of a little pain in the right side of the chest; during the night of the 13th he was *suddenly* seized with very acute pain in the left side, accompanied with oppression of breathing, and general distress. The following morning I found the face pale, the features sunken, the pain somewhat less severe; the breathing much oppressed; the head rather high; and the entire of the left side very sonorous under percussion. I deferred auscultating the patient, until after the visit, but leeches having been immediately applied to the painful place, I was prevented from completing my examination: he died at 4 p.m., retaining full possession of his intellectual faculties to the last.

Sectio Cadaveris; *forty hours after death.*

External appearances. Last stage of marasmus commencing; nothing else remarkable.

Head. A small spoonful of serosity in the lateral ventricle; the rest perfectly healthy.

Neck. Epiglottis natural. Several superficial ulcerations on the chordæ vocales, and over a space three lines [6 millimeters] broad below them. Trachea of a bright red colour throughout; the entire of the mucous membrane corresponding to the fleshy part of the tube destroyed: the membrane presented elsewhere numerous rounded superficial ulcerations, from one to two lines [2 to 4 millimeters] in diameter. There were similar ulcers in the soft part of the bronchi. The sub-mucous tissue underneath the large ulcerations of the trachea was

generally thickened, and in some places destroyed so as to give the whole a very uneven appearance.—Bronchial glands large, and of grayish colour; some of them studded with tuberculous particles.—Cervical glands perfectly healthy.

Chest. The left side very sonorous anteriorly; part of the pleural cavity was empty, the rest filled with lung (adherent to the costal pleura, over a surface three inches and seven lines [9 centimeters] broad) and with about a pint and three quarters [1 litre] of reddish serosity, holding numerous yellowish albuminous flocculi in suspension. A very soft pseudo-membrane invested the lower lobe, at the upper part of which was a hole, two lines [4 millimeters] broad, the orifice of a cavity of the size of a walnut, having walls covered with tuberculous detritus without pseudo-membrane, and communicating with the bronchi. This lobe contained gray semi-transparent granulations in numbers. The apex of the upper lobe was hard, and contained a great quantity of gray and blackish matter, in the midst of which appeared a tubercle of the size of a hazel-nut; elsewhere there was only a very little grayish matter tuberculized from place to place. The right lung adhered to the costal pleura by means of firm pseudo-membrane, two lines [4 millimeters] thick at the base. The upper lobe was almost wholly transformed into gray, shining, somewhat elastic matter, in the midst of which appeared numerous granulations of milky gray colour; it contained, likewise, at the apex, two cavities of the size of a nut filled with turbid reddish fluid, their walls covered with tuberculous detritus, without pseudo-membrane. The lower lobe contained a similar cavity, and numerous gray granulations, and was engorged in some places.—Heart perfectly healthy; aorta red from place to place throughout its entire extent.

Abdomen. Mucous membrane of the stomach tinged red in the fundus, where it was likewise softened from place to place; perfectly healthy near the pylorus, somewhat less consistent than natural elsewhere, partially ulcerated through in several parts of its lower half.—Numerous ulcerations running in a transverse direction, three of which encircled the entire bowel, in the middle third of the small intestine; lower down, the patches of Peyer were more or less completely ulcerated, the mucous membrane destroyed, and the sub-mucous tissue uneven, thickened, and excavated in numerous places: elsewhere

the mucous membrane perfectly healthy.—One large ulceration in the ascending colon, and great numbers of others of very small size, in the rectum, cæcum, and appendix vermiformis. Mucous membrane somewhat softened in the lower half of the large intestine.—Other abdominal viscera natural.

A survey of the preceding cases shows that at a certain period—more or less advanced in the course of phthisis—the patients were *suddenly* seized with pain of variable severity in one side of the chest, combined with dyspnœa, generally extreme in amount, and a state of inexpressible anxiety. These phenomena were followed by the general symptoms of pleurisy, and all continued either with unchanged severity, or with some remissions, to the time of death, which took place from twelve hours to thirty-eight days after their first appearance. (Cases XXIX, XXXI.) On post-mortem examination a greater or less quantity of air, of pus, or of sanguinolent serosity was found in the side of the chest which had been the seat of pain, and a perforation of the parenchyma of the lung in consequence of a tuberculous cavity opening in the cavity of the pleura.

The relationship subsisting between the symptoms and the condition of the lungs is so striking, that the simple statement of the facts suffices to display their mutual dependence. The pain corresponds to the irruption of the tuberculous matter into the pleura, and is caused by it; while the threatened suffocation and anxiety are the effects of the no less rapid effusion of a certain quantity of air, followed, more or less promptly, by that of some fluid of variable character. So that whenever violent pain, accompanied by much oppression of breathing and anxiety, with all the symptoms of acute pleurisy, displays itself *suddenly*, in one side of the chest of a phthisical subject, we are justified in believing that perforation of the lung, produced in the manner described, has taken place.

These symptoms are so much in conformity with what might, under the circumstances, be anticipated, that they appear almost as if determined *à priori;* and in consequence of the similitude of the conditions attending perforation of the small intestines and that of the lungs their nature might, further, it appears to me, have been suspected by reasoning on analogy. In one and the other case, in truth, effusion of an irritating

liquid into a serous sac takes place at the moment of perforation; and as sudden pain and the various symptoms of acute and violent inflammation arise in the one case, they might be expected to declare themselves in the other. And again, as suddenly developed pain, in a given spot in the abdomen, accompanied by the symptoms of intense peritonitis, suffices for the diagnosis of perforation of the intestine, it might fairly be supposed that the same would be the case in the instance of the lungs,—and that pain, similarly sudden and intense, in one side of the chest, combined with extreme dyspnœa, and the other symptoms of pleurisy would suffice, more especially in phthisical subjects, to announce that the pleura had given way.

Excessive difficulty of breathing and distress supervening suddenly, might again, independently of pain, lead to the recognition, or at least justify strong suspicions of the occurrence of perforation. But they would not suffice to render the diagnosis matter of certainty; for cases are occasionally met with in which patients, having excavations, of large size it is true, at the apices of the lungs, suddenly experience the oppression of breathing and the distress in question. Under such circumstances the observer must seek for other symptoms, the existence of which removes all doubt in cases such as that supposed, and adds materially to the certainty of the diagnosis in the others. These other symptoms are, as may have been gathered from the perusal of the preceding cases, sufficiently numerous. In truth, if the form of the chest were examined in those patients when the perforation occurred, or shortly after, a marked prominence was found on the painful side, the intercostal spaces widened and less hollow than on the opposite side, and exaggerated, actually tympanitic, resonance under percussion; while in the same situation the respiratory murmur was suppressed, feeble, or distant and confused, and unnatural in properties. The latter phenomena announced, as Laennec has shown, the presence of a certain quantity of air between the costal pleura and the lung; and as pneumo-thorax is one of the immediate effects of perforation of that organ, there is fair reason for believing, in analogous cases, that it is its result. But it is conceivable that were the symptoms mentioned at the commencement of this section, absent, the diagnostic importance of pneumo-thorax would be somewhat less; inasmuch

as it may exist, although beyond all doubt with extreme rarity, in non-phthisical subjects, independently of perforation. Such an occurrence is, it is true, very rare; I have myself observed but one example of it, and even then I am not certain that the pneumo-thorax had existed during life. M. Andral affirms he has never observed pneumo-thorax, unless in cases of perforation.

Be this as it may, instead of weak and almost suppressed respiratory murmur, a sound assimilable to that produced by blowing into an empty bottle,—amphoric respiration,—followed by metallic tinkling, became, a little sooner or a little later, audible in the cases I have narrated. These are most valuable diagnostic symptoms,—though not pathognomonic of perforation, inasmuch as they are sometimes met with in cases of large excavation, without any opening into the pleura. It is true that, under the latter circumstances, amphoric respiration and metallic tinkling are generally audible only within a limited space, but they may sometimes be heard over the entire or almost the entire chest: I have seen examples of the latter kind, and a very interesting one may be read in the essay of M. de Castelneau, on the physical cause of Metallic Tinkling,[1] so that the force of the preceding statement remains undiminished.

After the lapse of a variable time, effusion of fluid takes place into the cavity of the perforated pleura. In some cases this fluid is already abundant, so soon as a few hours after the opening has been effected, whereas in others its presence cannot be ascertained till a month or two later. It is then discovered by means of percussion or succussion,—the latter of which methods of examination gives rise, as is well known, to a sound of fluctuation, when air and fluid of any kind coexist in the cavity of the thorax.

Like all the phenomena of auscultation, amphoric respiration and metallic tinkling exhibit numerous degrees, and are subject to the very greatest variations. Thus, in instances where no change in the proportion of gas and liquid can be established, the amphoric respiration is sometimes strong, sometimes weak, or suppressed; the last state being most frequently observed at the anterior part of the chest. Amphoric respiration is also

[1] Archives gén. de Médecine, Oct. 1841.

sometimes inaudible in front, when the patients are seated, while it is heard when they stand up;—and this, in cases where no evidence exists in the presence of a fluid capable of changing the relations of the gas to the points of perforation. Again, in some cases metallic tinkling can only be detected with the voice, and in places where the respiratory murmur is suppressed.

As respects the mechanism by which the phenomena before us are produced, observers are generally agreed in regarding amphoric respiration as the result of the passage of air into the pleural cavity. But the same uniformity of opinion does not prevail regarding metallic tinkling. However, it is commonly supposed that the presence of a certain quantity of air is required for the generation of this phenomenon; and that it arises from the passage of bubbles of air through the liquid, or from the movement of air on the surface of this. But it is so common to detect metallic tinkling in cases where the existence of the smallest effusion in the pleura cannot, by any means, be established, and this for several successive days, or even weeks, that this mode of viewing the question must be given up. Hence we are led to admit the theory of M. de Castelneau, and, with him, to regard metallic tinkling as nothing more than mucous or cavernous rhonchus, resounding through a spacious cavity, by means of a communication established between that cavity and the bronchi.

This theory, as its author observes, is reconcilable with the peculiarities observed in the manifestation of the phenomenon; for these peculiarities are those of mucous rhonchus. Thus, this rhonchus exists in inspiration and in expiration, or in one or the other; it may disappear for a term of variable duration, and then return; and a fit of coughing may cause its development or its disappearance. And with respect to the metallic tinkling, which so commonly accompanies the voice and respiration in cases of perforation of the lung, this evidently depends upon the largeness of the area through which the expired and inspired air rings, independently of any kind of liquid,—the presence of which is by no means necessary, and would appear to be rather unfavorable than favorable to its generation.

The six cases of perforation related at the commencement of this section, with two others, which I have thought it unnecessary to retain in the present edition, were the only ones I had

met with in phthisical subjects at the time my Researches were published. Since then numerous facts, observed by others or by myself, have fully confirmed the diagnostic importance of the rational symptoms (independently of auscultation and percussion) to which I have judged it right to draw the reader's attention first. In one only of fourteen additional cases which have fallen under my observation, were the pain in the side, dyspnœa, and distress absent.

These symptoms presented tolerably numerous modifications, which it will be well to place before the reader.

Thus, the pain was severe in the subjects of Cases XXIX, XXX, XXXI, and XXXII; much less so in the others, without, however, losing its significance in regard of diagnosis,—and this, either on account of its sudden development, the dyspnœa with which it was accompanied or followed, or more especially the coexisting change in the character of the respiration. We have seen that the patient of Case XXXII fancied, at the moment the pain set in, or even a little before this, she felt air moving in the left side of the chest;—a sensation which continued for a certain time, and was, no doubt, really caused by the passage of air from the lung into the pleural sac. And indeed, instead of being surprised at the trifling differences referred to in the amount of pain, we should rather wonder at their not having been more considerable. Thus, it was not less severe in the subjects of Cases XXX and XXXIII, than in the others. Yet its physical cause was, in those two cases, only a very small tuberculous abscess, not evidently in communication with the bronchi, emptied into the cavity of the pleura; whereas, in the others, the tuberculous cavity presented considerable dimensions, and communicated freely with the bronchi. Lastly, it was altogether absent in one case where the perforation was large, the tuberculous cavity extensive, and the quantity of irritating matter, poured into the pleura, no doubt very great.

The dyspnœa and distress were severe, except in the subject of Case XXXII; nevertheless, this patient could not attempt to make the slightest movement without being threatened with leipothymia. The mode of decumbency of this individual was also matter of interest; he lay on the right side, with his head low, while the majority of the other patients sat up in bed.

It is further worthy of attention, that notwithstanding the

extreme and sudden obstruction of the circulation, the face retained, in many cases, its natural paleness. This circumstance cannot, nevertheless, be regarded as extraordinary; inasmuch as we daily see patients continuing pale during attacks of most severe dyspnœa,—for example, in cases of very advanced dilatation of the heart, and, in some cases, even of communication between the right and left cavities of that organ.

The length of time elapsing between the moment perforation is accomplished and death well deserves to be remarked. The fatal termination occurred sixteen, twenty-four, thirty-six, seventy-two hours,—six, twenty, and thirty-six days after the invasion of the first symptoms of perforation; and this intervening space of time may be even much more considerable. Thus, in a woman, whose case I shall by and by relate, it amounted to seventy-six days, in another to eighty-three, in a third to ninety-three; and in a case observed in my ward, in the Hôtel-Dieu, three years past, the notes of which were taken by Dr. Baron, jun., the first symptoms of perforation declared themselves eighteen months before death. During all that time the patient, a man aged twenty-four, had been in the constant habit of hearing a gurgling sound in the affected side, when he made the slightest movement; and this noise, which still existed at the period of the patient's admission into the hospital, placed the existence of perforation beyond the reach of doubt. A case, no less remarkable in respect of the present subject, was observed in the clinical wards of M. Chomel, twelve years ago. The effusion of fluid, which took place a certain time after perforation had occurred, made slow progress, and eventually filled the entire of the affected side. The signs of pneumothorax disappeared completely; the functions of digestion assumed healthy activity; the patient gained flesh, and several months after the period at which the effusion had reached its maximum, left the hospital in a much more satisfactory state than he was at the time of the perforation.

It is not always an easy matter to explain these very remarkable differences in the length of time elapsing between the moment of perforation and that of death. It is true that remarkable disparity in the amount of pulmonary disease, existing at the time of the accident, sometimes coincides with an analogous

difference in the duration of life after perforation. Thus the lungs of the subject of Case XXIX, who survived the perforation thirty-three days—a much longer time than the patients whose cases next follow—were much less deeply diseased than those of the latter. But, on the other hand, the duration of life, after perforation was accomplished, varied in the subjects of Cases XXX, XXXI, and XXXII, from some hours to eighteen days, although the local changes were in all three considerable. Nor do we derive any assistance in solving the problem from the consideration of the adhesions, more or less close and extensive, between the costal and pulmonary pleuræ; for these adhesions were of very much the same extent in the entire series of cases under consideration. Yet still there can be no doubt that the character of the adhesions has some influence on the duration of life, after the pulmonary pleura has given way, for the compression exercised on the perforated lung is inversely as the extent of the adhesions, and the peril incurred by the patient directly as the degree and extent of compression.

Another important peculiarity, which attracts the observer's attention on the first glance at the history of the phenomena of perforation, is the variableness of the period in the course of the primary disease at which that accident occurs. In some cases, in truth, a year and upwards elapses before its occurrence, in others a few months or a few days only, as the following case proves.

Case XXXV. A young woman, aged 23, was admitted into my wards in the Hospital Beaujon, upon two different occasions, the latter of these on the 28th of January, 1840. She began to menstruate at the age of twenty, habitually enjoyed good health, yet from the age of eighteen had been subject to epileptic fits of slight intensity but frequent recurrence. She did not cough habitually, and had no oppression of breathing, when she was seized, twelve or fifteen days before her admission, with slight cough, with which she spit a little. On the 24th of January she had, for the first time, an attack of rigors, which did not recur the following days, and on the 26th was awakened by a *violent* pain in the left side, opposite the union of the lower third with the upper two thirds, and by oppression of breathing to a moderate amount. The patient rose from bed,

however, in the hope of relief of the dyspnœa; but was obliged to return to her bed an hour after, in consequence of its violence. On the next day she had a new attack of pain on the other side. During the three following days the pain and oppression of breathing continued, the cough and expectoration diminished; she had some thirst, and completely lost her appetite. No nausea nor vomiting occurred. She came on foot to the hospital (she lived in the neighbourhood), but had been obliged to rest several times on the way, from the great oppression of breathing.

In the evening the house-surgeon found the respiration 50 and the pulse 120, and had her let blood to nearly twelve ounces [360 grammes].

29th. The blood drawn the previous day was buffed, and cupped,—the buff firm, and of yellowish gray colour; the patient was in a tolerably tranquil state, at least free from distress; the face natural in appearance, with the exception of violet discoloration of the lips; she was moderately stout; the pain in the right side was inconsiderable, that in the left continued, and was increased by coughing; the cough was not frequent; the sputa few in number; the breathing much less oppressed than before the bleeding. The left side was obviously fuller in front than the right; the intercostal spaces widened, and less hollow than on the other side; percussion more sonorous than in the natural state; the respiratory murmur extremely feeble, indeed almost suppressed. Posteriorly, on the same side, percussion was but slightly sonorous, in the lower three fourths, more especially the lowest of these; the respiratory murmur was very weak and superficial, and at the central part of the chest deep-seated amphoric respiration was audible. On the right side percussion was very sonorous, both in front and behind; under the clavicle sonorous rhonchus accompanied the respiratory murmur, and two inches [5 centimeters] lower down there were some bubbles of crackling rhonchus. Succussion produced no positive result; the patient lay on either side, right or left, indifferently; pulse 120, regular, small; skin moderately hot; no sweating; tongue greenish, rather moist; no thirst; complete anorexia; abdomen somewhat painful under pressure; bowels slightly relaxed for the last three days. Nothing else remarkable.

Infusion of triticum repens, with syrup of gum; nearly a grain and a half [10 *centigrammes*] *of powder of digatalis in two pills; diachylon plaster to the left side of the chest; low diet.*

The two following days the pain and oppression of breathing diminished; the pulse fell to 112; no amphoric respiration was audible; no other change.

Pergat.

On the 1st and 2d of February amphoric respiration again became audible during strong respiration, without preventing the vesicular murmur from being heard; some bubbles of crackling rhonchus under the right clavicle; slight oppression of breathing. Pulse, form and sonorousness of the chest as on the 29th of January.

From the 3d to the 8th, the vesicular respiration was very weak on the left side under the clavicle, and posteriorly, the amphoric respiration had disappeared, although the resonance of the voice was metallic in the postero-central part of the chest. On the 5th, fluctuation sound was heard on succussion, but only in front; and the patient declared that ever since her admission she had heard the same noise on making the slightest movement. The same day on account of the persistence of the pain in the left side, dyspnœa and slight spitting of blood (the first time of such an occurrence) she was bled to nearly six ounces [180 grammes]; the blood had the same appearance as that first drawn.—The pulse varied from 112 to 108.

From the 8th of February till the morning of the 16th, when the patient expired, the following were the phenomena observed.

More or less marked prominence of the left side of the chest anteriorly, with slight widening of the intercostal spaces, persisted to the end. The amount of sonorousness varied considerably; on the 13th of February, about eighteen days after the occurrence of perforation, it was almost natural under the clavicle, exaggerated two inches and four lines [6 centimeters] lower down, invariably dull in the lower three fourths posteriorly. On the 18th, the sound was somewhat less clear under the left than the right clavicle, except over a surface of one inch and two lines [3 centimeters] next the sternal articulation. On the 20th, percussion produced a dull sound posteriorly, both at the apex and base, and was very sonorous at the central part.

On the 24th, the sound became clear in every direction, except the lower fourth of the chest posteriorly; on the 28th, it was still clearer under the clavicle; on the 29th, perfectly tympanitic anteriorly, from which time the results of percussion underwent only unimportant changes.

The auscultatory phenomena on the left side were the following. On the 13th of February metallic tinkling became audible under the clavicle; a sort of deep-seated amphoric rhonchus followed the cough; and superiorly and posteriorly bronchophony free from metallic character could be distinguished. On the 15th, besides the rhonchus mentioned metallic resonance, diminishing rapidly in intensity from the clavicle downwards, was discovered; posteriorly metallic tinkling accompanied the voice, opposite the union of the upper with the middle third of the chest, near the spine. On the 18th, amphoric respiration and strongly metallic bronchophony existed in more than the lower two thirds of the chest. On the 22d, an extremely delicate amphoric sound was audible over a surface of considerable extent under the clavicle. On the 24th, amphoric respiration pervaded the entire of the posterior surface. On the 28th, no respiratory murmur could be detected anteriorly. On the 29th, amphoric respiration was audible anteriorly, but only in the sitting posture. March 1st. Bubbles of metallic-sounding character under the clavicle, when the patient lay down after having sat up. 4th and 10th of March. Metallic tinkling existed in the same place, both in the horizontal and sitting posture; very feeble vesicular respiration behind at the summit; amphoric respiration in the rest of the left side, less strong inferiorly than superiorly, with metallic resonance after the voice. 15th. Some amphoric bubbles under the clavicle, without respiratory murmur of any kind, in the horizontal and sitting posture; the same posteriorly, where some little subcrepitant rhonchus became audible after the cough. March 28th and April 5th. Amphoric respiration, with or without rhonchus of the same kind, under the clavicle. 15th (the day before the patient's death), the patient maintained the sitting posture on account of the violence of the dyspnœa, and extremely marked amphoric respiration was audible over the entire posterior surface of the chest, even at a distance of about two inches and a half [6 centimeters] from the surface.

Succussion practised seven times up to the 15th of March by the patient herself, produced on each occasion, in front only, however, the sound of a fluid shaken in a narrow space.

The oppression of breathing varied as the cough and pain; the respiration never exceeded 48 in a minute.

The pain in the right side had completely disappeared on the 7th of February, as did likewise that on the left on the 9th, after cupping. No further complaint was subsequently made of either.

The sputa, opaque, of greenish colour, and more abundant from the 8th to the 12th of February than the previous days, exhibited no determinate form. On the 12th, after an attack of rigors in the night, recurring too from time to time in the morning, the patient in the midst of violent coughing brought up, between 4 and 7 o'clock in the morning, a quantity of yellowish white sputa, free from air almost, without smell, and floating on a clear fluid, sufficient to fill two spitting-vessels. Similar expectoration continued the next night; somewhat less abundantly the 14th; on the 15th, the matter expectorated was whitish, somewhat frothy, and scarcely covered the bottom of the spitting-vessel. On the 19th and 20th, further diminution in the cough and expectoration; this continued the following days. In the evening of the 17th, the patient, after an attack of rigors which lasted about half an hour, coughed up, with efforts like those of vomiting, a matter of greenish white colour, homogeneous, free from air, without smell, and ropy in part, sufficient in quantity to fill the spitting-vessel. 29th. The same occurrence again took place, without previous rigors. March 2d. The spitting-vessel contained a greenish and whitish matter opaque, puriform and liquid, in moderate quantity. On the 7th, for the first time, the sputa, more or less thick, non-puriform, and moderate in quantity, exuded the smell of rotten eggs, and this odour continued, growing daily more fetid, till death. The patient's breath was tainted with it, and I frequently found her spitting-vessel empty at the time of my visit; the smell of the expectoration being so abominable as to require it to be thrown out as soon as possible.

The pulse varied frequently: beating, about 108 times in the minute, from the 8th to the 12th; it had risen to 132 on the morning of the 19th, the patient having had four epileptic

fits in the night; and beat 136 the following morning, after a still worse night; on the 21st, it reached 140, without any other cause having occurred to explain this great frequency. Somewhat less frequent the following day; it again rose to 140 on the 27th, and had acquired greater fullness than usual, while the skin had become unusually hot; no new symptom had occurred to explain the change. 1st and 2d of March, the skin was still hot, and the pulse at 120; it beat from 112 to 100, on the 10th and 12th, and was full and regular. On the 28th it rose to 145, and became somewhat irregular; the following day, beat 116; the 4th of April, 104; the 8th, 96, and was small and weak; the evening of the 15th, the day before death, it rose to 140, but continued regular.

Rigors occurred, as has been already stated, on the 12th, 21st, and 29th of February, followed by fits of coughing, and more or less abundant expectoration. The last fit took place on the 2d of March.

The breathing was not very materially laborious, except upon the day of, or the day after, the attacks of rigors, and the closing days of life.

From the 26th of February, the patient had generally two or three stools daily. The diarrhœa did not become considerable till the last week of existence.

The appetite kept up tolerably well; she eat a quarter of house-allowance, rarely more than this; but was limited to broth when increase of the diarrhœa occurred.

When the diarrhœa came on, she was taking gentle diuretics, such as powdered digitalis, in pills; she was then put upon slight astringent mixtures, and opiates were administered by the mouth or anus.

She expired on the 16th of April, having on the previous evening eaten some pease-soup, with appetite. About midnight she rose from her bed, and ran about the wards, saying that she wished to go away. This state of excitement lasted a short while after she had been brought back to her bed; tracheal rattle soon came on, and she expired at 3 a.m.

Sectio Cadaveris; *thirty-one hours after death.*

External appearances. Emaciation to a moderate amount; general cadaveric rigidity.

Head. Fragile adhesions between the dura mater and cra-

nium ; glands of Pacchioni moderately abundant along the falx cerebri. One tablespoonful of transparent serosity in each lateral ventricle. The whole encephalon, minutely examined, is found perfectly healthy ; the fissures of Sylvius as well as other parts.

Chest. Form of the thorax as during life. A small incision made into the left side allows of the escape of gas, with a very fetid odour, resembling that of the patient's breath for the last month of her existence ; a slight noise accompanied its escape. The lung, adherent, from base to apex, to the spine, is flattened from without inwards ; at the posterior border, where thickest, it measures from an inch and two lines to an inch and six lines [3 to 4 centimeters] in thickness ; from five inches and two lines to five inches and a half [13 to 14 centimeters] in height, and four inches [10 centimeters] from before to behind. The remainder of the thoracic cavity is filled with fetid gas, and a yellowish and greenish purulent fluid, thickest when most dependent in position, and valued at from sixteen to upwards of nineteen ounces [500 to 600 grammes]. The interior of the cavity is lined with a yellowish-white pseudo-membrane, smooth in some places, uneven in others, and looking as if mammillated, from half a line to a line and a half [1 to 3 millimeters] thick, easily removable in large pieces, united to the pleura by very delicate, grayish-coloured filaments, which give way under a slight degree of traction, on removing the pseudo-membrane ; where this is removed the subjacent pleura appears tomentose, grayish coloured ; and less transparent than in the natural state. The cavity is crossed by two bands, processes to all appearance of the pseudo-membrane. The interior of these, upwards of an inch [25 millimeters] long, free all round, thin and rounded at its central part, and thick at its extremities, unites the synchondro-costal articulation of the fifth rib to the external surface of the lung, near its acute edge, three inches and two lines [8 centimeters] below the apex. The other also stretching from the externo-posterior aspect of the lung to the corresponding part of the thoracic parietes, measuring two inches and three lines [55 millimeters] in length, and exhibits the form of an elongated cone, the base of which, turned towards the lung, measures upwards of an inch [25 millimeters] in diameter, and extends to within four lines [1 centimeter] of the apex of the

lung. These bands, exhibiting a whitish yellow colour externally, and a pink internally, are uninterruptedly continuous with the pseudo-membrane described; and the second, likewise, presents internally, at its base, a conoid prolongation of pulmonary tissue, about nine lines [2 centimeters] long, exhibiting all the characters of that tissue when submitted to protracted pressure. In the middle part of the external surface of the lung appears also an opening, four lines [1 centimeter] broad, with soft and smooth edges, lined by a prolongation of the pseudo-membrane, which passes into a sort of canal, forcing at the same time its walls, and after a course of four lines [1 centimeter] in length, unites with the bronchus of the lower lobe. The lung itself is heavy, and sinks to the bottom of water; its section very little moist, deep in colour, indeed almost black. Both lobes contain gray semi-transparent granulations, and unsoftened tubercles; they are more numerous in the lower than in the upper lobe, and posteriorly than anteriorly.—Right lung adherent in every direction to the costal pleura, by means of close cellular adhesions. Heavy, aud of violet colour, its surface exhibits a multitude of inequalities produced by tuberculous granulations of the size of a hemp-seed, seated immediately underneath the pleura. Four inches and four lines [11 centimeters] below the apex, and bounded on all sides by adhesions, is an oval opening, four lines [1 centimeter] broad, opening into a cavity of double that diameter, seated quite at the surface of the lung, filled with yellow, semi-liquid tuberculous matter, and having no discoverable communication with the bronchi. Quite at the apex is a cavity of the size of a small walnut, and on the upper and middle lobes an innumerable quantity of tubercles, from one to two and a half lines [2 to 5 millimeters] broad, whitish, friable, and opaque; whereas the lower lobe contains only gray semi-transparent granulations. —The pericardium contains 2 ounces [60 grammes] of clear serosity.—Heart natural.

Abdomen. Peritoneum natural.—The stomach, of moderate size, contains some pease-soup; the mucous membrane, generally mammillated, presents nothing else worthy of remark.—Intestinal canal and other viscera natural.

This case, a remarkable one in many points of view, is more

peculiarly so on account of the period at which the perforation took place. The first symptoms of phthisis had, in truth, scarcely appeared *fifteen days,* when those of perforation of the left lung declared themselves,—at a period consequently when common experience would have led us to expect anything but such an occurrence. Cases of this kind are fortunately very rare, and this is the only one which I have myself observed in the course of twenty years, and out of upwards of six hundred phthisical subjects whose bodies I have opened.

Another circumstance, almost as remarkable, is, that twenty-four hours after the invasion of the pains in the left side, similar pain occurred in the right, in the situation of a perforated cavity. This perforation was without importance, as it were, on account of the general adhesions on this side ; had it not been for these adhesions there would have been symptoms of double perforation, and death must probably have occurred in a few hours,—although the alterations existing in both lungs were very limited, and the tubercles few in number, and in an early stage of development.

The adhesions on the left side, much less extensive than those on the right, in all probability exercised a very material influence on many of the phenomena observed during the patient's stay in hospital. Thus, on several different occasions, vesicular respiration and amphoric respiration were detected in one and the same point posteriorly near the spine : this fact led to the opinion that the lung was separated from the costal pleura by a thin stratum only of air, and this in truth was the case in consequence of the adhesions.

The sub-crepitant rhonchus, heard in the neighbourhood of the spine, is also explicable by consideration of the adhesions ; had these not existed, it would doubtless, in conformity with the notions of M. de Castelneau, have been transformed into metallic tinkling.

No doubt, too, that the disease would have run its course more rapidly from the period of perforation, had it not been for the bands which bound the left lung to the costal pleura, at first rather closely, subsequently more loosely,—a change produced by the sort of struggle between these bands and the compressing force of the air poured into the cavity of the pleura. This struggle was testified to by the condition of the bands

themselves, one of which contained at the base a prolongation of pulmonary tissue, nine lines [2 centimeters] long, the existence of which prolongation supposed the exercise of more or less considerable traction on the band itself.

The variations in the amphoric respiration and metallic resonance of the voice are by no means calculated to excite surprise; as similar variations are commonly discoverable in all auscultatory phenomena. Amphoric respiration, audible at a certain distance from the surface of the chest, had probably not been observed before; and I am inclined to believe the same may be said of the fluctuation, determined by succussion, and limited, as it always was, in the present case, to the anterior part of the chest.

The cases which have been related deserve to be made the subject of some remarks bearing upon the anatomical conditions of the solution of continuity under consideration. The perforation occurred in five sixths of the cases near the angles of the third or fourth ribs; that is, in a place corresponding to that where the pain was felt, and where pleuritic adhesions, when not general, commonly terminate. In the other cases the seat of the perforation was more or less distant from the apex of the lung. In one instance, observed two years ago, perforation had taken place at the apex;—a situation in which the rarity of its occurrence is explained by the frequency of adhesions there.

Another circumstance deserving of some attention is, that in seven of the eight cases of perforation which had fallen under my observation, when the first edition of this work appeared, the left was the side implicated;—where, as has already been mentioned, tuberculous disease is somewhat more frequent and pretty frequently more advanced than on the right side. The greater frequency of perforation in the left than in the right side has been confirmed by the observations of other persons; though the precise ratio, as might have been anticipated from the smallness of the number of cases from which mine was deduced, has been modified. Thus Dr. Reynaud found, in forty cases of perforation in phthisical subjects, ascertained by post-mortem examination, that the perforation had occurred twenty-seven times on the left, and thirteen times on the right side; and that in ten similar cases, in which post-mortem examination was not made,

the left was the side affected in six cases, the right in four. So that of fifty examples of perforation of the lungs in phthisical subjects, thirty-three were furnished by the left side, seventeen by the right,—a ratio of 2 : 1.

The reader has perhaps remarked with surprise, that there was but one perforation in each of the cases I have narrated. It must not, however, be forgotten, that in several of them the external surface of the same lung exhibited a great number of yellow and white spots, corresponding to the seat of softened tubercles underneath; and that these tubercles, separated as they were from the pleura by a distance of less than half a line [1 millimeter], might be regarded as on the point of bursting into the pleural cavity. Besides the adhesions of the costal and pulmonary pleura, especially at the apices of the lungs, which are of almost constant occurrence in phthisical subjects, furnish a sufficient explanation of the comparative infrequency of perforation. Nor, on the other hand, is it exceedingly rare to find more than one perforation in the same organ, and the form the openings present may differ materially from that observed in the preceding cases. The following case, the notes of which were also taken by M. Cossy, furnishes an illustration of both these facts.

Case XXXVI. A mantua-maker, aged 23, of good height, and delicate constitution, thin (as she had always been), with fair hair and delicate skin, was admitted into the Hospital Beaujon on the 7th October, 1840. Generally speaking, she enjoyed good health, and had been seized after a favorable confinement at the full time, without any assignable cause, with slight cough, and pain below and outside the left breast, at first of trifling amount, but subsequently increasing in severity: this occurred in the middle of June. Her strength next failed considerably; so much so, that in less than a month from the outset of her illness, she was obliged to keep her bed. She had kept it for three months, when removed to the hospital. She began to lose flesh at the same time as the failure in strength manifested itself, although the appetite continued good; there had been alternations of diarrhœa and constipation, and profuse night-perspirations, without excessive heat of skin. The menses had not reappeared; there had been no hemoptysis at any period.

A large blister had been applied to the left arm, shortly after the invasion.

October 8th. Decumbency dorsal, the head rather high; face pale, with the exception of redness over the malar bones; look of weariness and depression; extreme weakness, to such a degree that the patient cannot either raise herself to the sitting posture, nor even give any assistance when raised to that posture for the examination of her chest; intelligence good; memory accurate; dyspnœa; pain, of rather trifling severity, on the left side. Prominence of this side anteriorly, with deficient hollowing of the intercostal spaces; from the clavicle to the edge of the false ribs tympanitic sonorousness, without vesicular or any other sort of respiration. Posteriorly the chest is prominent and sonorous as in front; each inspiration is accompanied with sibilus, and no respiratory movements audible. On the right side the respiration is bronchial under the clavicle, and accompanied with some crackling rhonchus; sputa whitish, opaque, slightly thick; slight heat and moisture of skin; pulse 124, regular, small; tongue yellowish; appetite keen; thirst slight; one liquid stool; abdomen free from pain, and natural in shape.

Solution of syrup of orange-peel; gum potion with three quarters of a grain [5 *centigrammes*] *of opium; half portion of vermicelli.*

The following were the facts noticed from the 10th to the 19th of November.

The sonorousness and prominence of the left side continued strongly marked over the entire surface, until the 7th of November; and on the 22d of October the tympanitic sound extended two inches, or two inches and four lines [5 or 6 centimeters] beyond the median line. On the 7th of November, percussion furnished a dull sound in the lower half posteriorly, and indeed, there was no sound at all in the inferior three inches and seven lines [9 centimeters].

On the 10th of October, the respiratory murmur was amphoric on the left side, and of such clear quality that it resembled the sounds of the harmonicon.—11th. A few bubbles of amphoric rhonchus became audible, behind only.—From the 12th to the 22d, no kind of respiratory murmur could be detected anteriorly, whereas posteriorly, weak vesicular respiratory murmur was perceived near the spine, with or without some bubbles

of sub-crepitant rhonchus inferiorly.—28th. No inspiratory murmur could be heard in front, where the expiratory murmur was prolonged, and the vocal resonance metallic.—The 30th and 31st. The resonance of the voice was followed by a very strongly marked silvery amphoric sound.—The 2d and 4th of November. The respiration was amphoric posteriorly, after coughing, and the resonance of the voice general and metallic.—7th. The respiratory murmur was amphoric behind, after speaking, vesicular and very weak at the apex; and when the patient lay down, after sitting up, a few bubbles, bursting with a metallic quality, and unaccompanied with respiratory murmur, continued audible for a few seconds. The same absence of respiration existed anteriorly on the 9th; whereas on the 14th, a murmur of respiration of amphoric kind was audible there in deep inspiration. The 17th (two days before death), the respiratory murmur had the amphoric character anteriorly, where a sort of metallic pectoriloquy was also audible. Posteriorly, amphoric respiration, strongly marked, accompanied the cough and voice; and from time to time distinct and distant bubbling might be detected during cough.

The dyspnœa, which had been slight until the 7th of November, became more or less considerable after that period.

The sputa continued more or less abundant, greenish and whitish coloured, and free from smell, until the 16th of November. On the 17th, some of those which had been expectorated on the previous day, were spumous and of a fine red colour.

Between the 15th of October and the 17th of November, the pulse varied from 116 to 88, continued invariably regular, commonly weak and small, on rare occasions acquiring a little fullness. The skin was always moderately hot, and generally speaking a little moist.

The strength improved somewhat for a few days after the patient's admission; on the 7th of November, though still excessively weak, she was able to raise herself to the sitting posture without help.

She had but little pain until the 1st of November; it became rather severe the three following days, during which the perspirations were more profuse than either before or after. It diminished after this, increasing again on the 17th, the day before death.

On the 22d of October, the tongue, the internal surface of the lips and cheeks, which had been painful for the last twenty-four hours, exhibited a pultaceous exudation, under the form of small white pustules, between which the mucous membrane was of, more or less, light red colour.—On the 28th, the tongue, though exhibiting the same appearance, had become somewhat less painful; from the 7th to the 14th of November, it was moist and clean.—The appetite continued tolerably good till the 8th or 10th of November, the patient eating soup twice almost every day, a fresh egg, and a little bread. The diarrhœa which existed on her admission continued inconsiderable to the end.

On the 14th of November a slough, nine lines [2 centimeters] broad, was found on the right trochanter major, on which the patient habitually lay; the same day the skin over the sacrum appeared of bright red colour.

She had opiates to the end; and on the 4th of November, acetate of lead in addition, administered in consequence of the increased profuseness of the night-perspirations.

Sectio Cadaveris; *thirty-one hours after death.*

External appearances. Considerable emaciation; abdomen flat, and greenish coloured; no cadaveric rigidity.

Neck. Larynx and trachea natural.

Chest. Left side prominent, widened from base to summit; no depression in intercostal spaces; sound under percussion tympanitic. When a small opening is made in one of those spaces, some gas with the smell of rotten eggs, escapes with slight noise. One third of the cavity was filled with an opaque, flocculent, greenish-yellow fluid, exhaling the same smell;—the rest, with gas and the lung, which was flattened from without inwards, and adherent to the vertebral column from base to summit. A soft pseudo-membrane, free from all trace of organization, lined the interior of the cavity, the lung as the rest; and the two bands to be next described. These bands were of cellular structure, and flattened in form, from half a line to a line [1 to 2 millimeters] thick, and from four to nine lines [1 to 2 centimeters] broad. One of them extended from the sternal extremity of the first rib to the anterior border and apex of the lung; the other of somewhat less length, and situated posteriorly, passed from the middle part of the second rib to the corresponding part of the external surface of the lung. This

organ, which was not more than an inch and a half or two inches [4 or 5 centimeters] thick at the base, went directly to the bottom, when thrown into water, and exhibited at its inferior and external aspect twelve or fifteen irregular fissures, either followed with tuberculous matter or empty, and allowed of the escape of air blown in through the bronchi, the lung meanwhile undergoing no distension from it. Three other oval fissures, from two and a half to four lines [5 to 8 millimeters] in their greatest diameter, and also filled with tuberculous matter, existed at the posterior surface of the lung, and in these places the costal pleura was also destroyed. Numerous sections of the lung displayed a yellowish white colour, with black points caused by friable tuberculous matter, divided into irregular compartments, by blackish-coloured septa, themselves formed of pulmonary tissue. When water was allowed to fall with some force against the surface of these sections, it washed away the tuberculous matter, and left in its room a vast anfractuous cavity, divided into several loculi by imperfect septa, formed of a blackish tissue, friable in some places, firmer in others, but exhibiting in none the vesicular structure. The same appearances existed in the lower lobe, but to a somewhat less advanced amount.—The right lung was completely free from adhesions, and very light. The air-cells, more or less dilated over its entire surface, reached, at the apex, and in the fissure, as much as a line [2 millimeters] in diameter, and a little more or a little less than half a line [1 millimeter] elsewhere, as well at the acute border, as on the rest of the surface. The upper lobe presented at its summit an excavation an inch and two lines [3 centimeters] broad, filled with greenish-coloured and opaque matter, and elsewhere rounded tubercles of yellowish white colour, friable, scattered or collected in groups and masses; one of the latter, more superficially placed, and of larger size than the others, was surrounded with red, friable, granular, hepatized tissue. In the two other lobes, there were only gray semi-transparent granulations, either isolated, or collected in numbers of three, four, or more.—Heart natural; pericardium contained scarcely half an ounce [15 grammes] of lemon-coloured serosity, and passed three inches and two lines [8 centimeters] to the right of the middle line.

Abdomen. Nearly ten ounces [300 grammes] of lemon-co-

loured, perfectly clear serosity in the cavity of the pelvis; peritoneum natural. Stomach rather large; mucous membrane covered with grayish ropy mucus, so much attenuated and softened in the fundus as to give no strips; natural elsewhere.—Irregularly-shaped ulcerations, in considerable number, with whitish fundus, formed of the sub-mucous cellular tissue, in the lower twenty-eight inches [72 centimeters] of the small intestine.—Ileo-cæcal valve completely ulcerated; from the fundus of the ulcer spring soft reddish vegetations.—The large intestine presents nothing worthy of note, except some prominent crypts. The other abdominal viscera natural.

The perforations were, it appears then, numerous in this case (fifteen in number), and presented the form of elongated furrows. This form is very different from that commonly noticed, and depended in this instance, in all probability, solely on the fact of the tuberculous matter being infiltrated, and not deposited under the form of little tumours placed more or less near to or distant from each other. It is very probable. besides, that these numerous perforations were effected successively, or the symptoms, referrible necessarily to these, would have been more severe, and death their more rapid consequence.

In the present, as in the preceding case, there were adhesions of old standing, at the posterior part of the perforated lung; adhesions which, no doubt, for some time prevented the compression of the lung from being complete opposite them, and rendered the respiratory murmur audible there.

As respects the bubbles, which appeared to burst with a sort of report on the surface of a liquid, when the patient raised herself from the lying to the sitting posture, they would seem to justify the conclusion that metallic tinkling, though always due to the more or less forcible bursting of bubbles, may vary in its seat.

Here, as in the case last narrated, the matter, effused into the pleura, was true pus of very fetid odour; but here the breath and expectoration were not tainted by it, most probably in consequence of the want of freedom of communication between the pleural sac and bronchi: the reality of this communication could, in truth, only be demonstrated by insufflation in the dead body.

The progress of effusion was not rapid in the two last-related cases; but this is far from being always the fact. Thus the effusion was of considerable amount in the subject of Case XXXI, who expired twenty-four hours after perforation, although twelve hours before her death percussion furnished a perfectly clear sound over the entire of the affected side; so that here the effusion must have accumulated in less than twelve hours. The same may be said of another patient (Case XXXII), in whom the exhalation of serosity, though produced, at least to an appreciable amount, a long time before death, was no less rapidly effected. These cases, however, are in nowise extraordinary; they merely recall to the mind of the observer the celerity with which effusion takes place in many cases of simple pleurisy, and furnish a clearer proof of this even than can be obtained during life, by means of percussion and auscultation. They are in perfect accordance, too, with what takes place in the radical cure of hydrocele, by injection, after which a considerable effusion of purulent serosity forms in the course of a few hours in the tunica vaginalis.

It is further worthy of observation that in cases where death occurred twenty-four hours after the perforation had been effected, a soft pseudo-membrane, possibly already organized, covered the entire surface of the lung and pleura.

I shall not delay any longer with the consideration of certain other peculiarities relating to the cases given in this section, and which are deserving of some attention; I shall merely observe that in these cases, as in those of sudden death, there was but very little serous effusion in the ventricles of the brain;—and that in spite of the obstruction suddenly occurring in the circulation, and sometimes persisting for several days, the mucous membranes were not redder than in several cases where the circulation had been much less impeded. The latter circumstance appears to show that such obstruction must have existed for a long time in order really to produce the engorgement of the vessels of the mesentery and mucous membrane, which is, in many cases, ascribed to it.

CHAPTER II.

COURSE OF PHTHISIS.

Phthisis, like other chronic diseases, may present numerous variations in its course. I have seen it prove fatal within a period, varying from three months to twenty years; and the tendency of the disease to cause a simultaneous or successive formation of tubercles in different parts of the system, is one of the most powerful reasons of these variations. It has been seen, in truth, that gray semi-transparent granulations may form in the meninges at any period of the primary disease, and rapidly cause the destruction of the patient. The same may be said, though with some modification, of pleurisy caused by tubercles developed immediately under the serous membrane, and of tuberculous peritonitis. The tendency to ulceration, which is one of the most remarkable characteristics of phthisis, may, again, quite independently of the condition of the lungs, very materially hasten the fatal issue of the malady, whether the ulcerating process be in action in the air-passages or the alimentary canal. And, unaided by the influence exercised by these accessory morbid changes, phthisis may entail death in less than three months; the fatal event may occur with such suddenness as to take both the patient and his physician by surprise; or the disease may run its course without being accompanied by the majority of symptoms commonly attending it. Here are signified certain varieties of the course of the malady which it is matter of importance to study fully; and with this view I shall relate, in successive sections, some examples of acute phthisis, of sudden death, and of a latent course of the disease.

SECTION I.—ACUTE PHTHISIS.

Case XXXVII.—A girl, aged 18, of tolerably strong constitution, with chesnut coloured hair, firm flesh, and tolerably full

person, was admitted into the Hospital of La Charité on the 29th of April, 1822. She was not subject to colds, generally speaking, enjoyed good health, and had only been fifteen days ill when admitted into the hospital. The invasion was marked by rigors, with trembling, followed by heat and perspiration; the rigors recurred several times subsequently, the heat of skin continued more or less considerable, and there was considerable thirst; nausea occurred from time to time, and still more rarely, the patient vomited a few mouthfuls of bile; she had completely lost her appetite; and frequently suffered from constipated bowels; her strength failed as the other symptoms became more severe; and on the *tenth* day of the disease slight cough came on, with expectoration of a few sputa. The catamenia, first established at the age of fifteen, had not reappeared for three months. The patient had not taken to her bed.

April 30th. *Present state.* Face animated, headache, with feeling of weight; sensation of lassitude in the limbs; respiration 44; cough frequent; sputa semi-opaque, slightly greenish in colour, and containing a moderate quantity of air; pain at the central part of the sternum and under the left clavicle; sonorous rhonchus in both sides of the chest; pulse 103, neither full nor hard; intense heat of skin; perspiration at night; tongue red at the edges, white in the centre; mouth dry, clammy, and bitter tasting; thirst urgent; anorexia; one liquid stool in the night.

Twelve leeches to the genitals; infusion of violets sweetened and acidulated; solution of syrup of gum; emollient enema, to be repeated twice.

May 1. General uneasiness increased; pain in the right side of the chest; sputa abundant, greenish coloured, streaked somewhat with yellow lines; auscultation as on the previous day.

Poultices to the painful part.

May 2d. No change of consequence; perspiration in the night; slight diarrhœa; a few sudamina.

Blister to the painful part.

From this period till the 19th of May, the affection ran a rapid and uniformly progressive course; the respiration was deep, and from 53 to 60 in the minute; the cough extremely violent, and generally more troublesome in the night than by

day; the sputa more or less abundant, mucous, aerated, or completely opaque, greenish coloured, free from air, and streaked with yellow lines; the chest, percussed on several occasions, emitted a clear sound; on the right side a good deal of mucous rhonchus became audible on the 7th; on the 10th some crepitation round the mamma, with the respiratory murmur stronger than on the other side. On the 18th a sort of humid clicking noise accompanied each respiration, over almost the entire anterior surface of the chest; a little crepitation on the left side.

The frequency of the pulse increased daily; on the 16th it had reached 174 in the minute; the skin very hot and dry; perspiration every night regularly till the 12th.

The state of anorexia continued, with thirst so urgent that the patient drank from eight and a half to ten pints [5 to 6 litres] of ptisan in the twenty-four hours; she had nausea, and occasionally vomited bile; suffered from epigastric pain the closing seven days, and had a little diarrhœa constantly.

The general uneasiness was constant and progressive; the face expressive of bewilderment, and pale; the features altered about the 16th. During the night of the 18th her speech became embarrassed, and she had slight delirium; she cried out for help to *free her from her pain in the chest.* She expired on the 19th, at 3 a.m.

The blister dried a few days before death. The ptisan first ordered was continued; she had linseed enemata frequently, and during the last week the dryness of the skin led to the trial of a few tepid baths, taken at the bedside.

Sectio Cadaveris; *twenty-four hours after death.*

External appearances. Strongly-marked cadaveric rigidity; second stage of marasmus.

Head. Slight sub-arachnoid infiltration. Brain perfectly healthy.

Chest. Left lung presents some adhesions posteriorly; the upper lobe contains a tolerable number of gray semi-transparent granulations, and small unsoftened tuberculous masses, surrounded with slightly engorged tissue; the engorgement more marked at the base of the inferior lobe, which contains but few granulations.—The right lung adhered on all sides to the costal pleura, and was transformed, almost entirely throughout the

periphery of its base, into a mass of tuberculous matter, of a delicate pinkish tint, in the midst of which appeared a fluid of tolerable thickness, small in quantity, and of the colour of lees of wine. Elsewhere this lung contained a great number of gray semi-transparent granulations, and small nodules of slightly softened tuberculous matter; its tissue was slightly engorged.

Abdomen. Mucous membrane of the stomach, covered with viscid mucus near the pylorus, exhibits some reddish mottling in the fundus.—Small intestine, colon, and abdominal viscera natural.

In this case the transition from the state of health to that of disease was suddenly effected; the moment at which the one ceased and the other began cannot be matter of question; the disease lasted thirty-five days, and the cough twenty-five only. The severity of the symptoms was no less remarkable than the rapidity of the course of the affection. At first febrile action of extreme intensity set in, followed after ten days' duration by symptoms of catarrh, cough, expectoration, and oppressed breathing; on the sixth day of the cough, respiration was repeated forty-seven times in the minute, and this remarkable acceleration increased still further afterwards; the skin became exceedingly hot, the pulse very frequent. All these phenomena indicated the existence of acute disease of the lungs. Nevertheless, the sound of the chest continued clear; auscultation furnished almost negative results, did not give evidence of intense pulmonary catarrh, and simply justified a suspicion, a few days before death, of the existence of the first stage of pneumonia, incapable in itself of explaining either the previous or existing symptoms. In this state of things, was it matter of possibility to detect the nature of the affection?

No doubt auscultation might have been more carefully practised; I ought to have investigated the state of vocal resonance all over the chest;—but supposing such examination to have been made, should I have been better prepared to establish the diagnosis? I believe that I should not. In truth, admitting the existence of more or less marked resonance of the voice at the inferior part of the right lung, I could not have ascribed it to the existing cavity, unless on the supposition that, contrary

to the general rule,[1] the tuberculous matter had been developed from the base to the summit of the lung, and reached a more advanced stage in the former than in the latter position,—now this would have scarcely been a tenable hypothesis. Hence, both the severity of the symptoms, and unaccustomed mode of anatomical progress of the disease, appeared to combine to deceive the observer. The absence of the symptoms proper to pneumonia and pleurisy, added to the appearance of the sputa, led to the idea of phthisis for a moment; but too many circumstances appeared opposed to this notion, to allow its author, M. Chomel, to follow it up. However, this circumstance should not be lost upon us; it gives new evidence of the importance of the sputa as a diagnostic sign, and shows the utility of accurately examining their characters.

It is besides very remarkable that, notwithstanding the extreme rapidity with which the tubercles were developed, there was little or no inflammation around them, and more especially in the right lung.

I shall not make any particular observations on the gastric symptoms, on account of the very incomplete and superficial manner in which the digestive organs were described. I may, however, remark, that the bilious vomiting, connected with the mottled state of the mucous membrane of the stomach, might lead us to suspect, but by no means establish, the existence of a morbid condition of some importance.

In the following case the tuberculous disease was not the immediate cause of death, but it set in with the same violence as in the case just narrated, and for this reason, I record it in connexion with the former.

Case XXXVIII. A teacher of the piano, aged 46, of middle height, strong constitution, broad-chested, and rather stout, was admitted into the Hospital of La Charité on the 6th of October, 1823, having been then three weeks ill. This illness had commenced without assignable cause after a moderate meal, by trembling, soon after followed by heat, and the latter had ever since continued more or less marked. After the first thirty-

[1] Of the one hundred and twenty-three cases forming the groundwork of these researches, the present is the only instance in which the development of tuberculous matter proceeded from the base to the apex of the lungs.

four hours, difficulty of breathing was felt; this dyspnœa made constant progress, and from time to time slight cough occurred. For the last eight days, he had suffered from urgent thirst, and had totally lost his appetite. No painful sensation at the epigastrium, nausea, or vomiting: bowels confined.

October 7th. *Present state.* Expression of combined uneasiness and apathy in the face; answers slow; headache; respiratory movements confined and frequent; considerable oppression of breathing; he coughs seldom; a few mucous sputa containing a little air; weak respiratory murmur without rhonchus under the right clavicle,—natural elsewhere; skin moderately hot; pulse 80; tongue yellowish in the centre, natural at the edges; anorexia; no great thirst; sensation of heat and dryness in the pharynx; deglutition easy; no epigastric pain; bowels confined.

Infusion of violets with syrup of gum; gum potion with oxymel; linseed enema.

8th. The sputa being slightly viscid, he was bled to about ten ounces [300 grammes].

9th. Expectoration less viscid; breathing very much as on the first day; results of percussion and auscultation as before; tongue somewhat red at the edges; considerable heat and dryness of the pharynx; the latter and the tonsils rather bright coloured; dysphagia; thirst moderate; skin hot; pulse 104. The blood drawn the previous day covered with a slightly grayish buff about a line [2 millimeters] thick.

Pectoral ptisan with oxymel; gum potion, with half an ounce of oxymel of squills; blister six inches broad to the front of the chest.

10th. Skin somewhat less hot, and pulse a little slower than the previous day.

11th. Sputa slightly viscid, white and aerated; respiration as on the 9th; no crepitation audible anywhere; sound under percussion *clear in every situation;* pulse 96, rather weak; pharynx and tonsils as before; general uneasiness increased; movements unsteady and troublesome to the patient. Two liquid stools.

12th. Pulse somewhat less frequent; face expressive of depression; speech slow; uvula œdematous; the patient only complains of inconvenient heat in the pharynx and along the neck.

No appreciable change on the following day. On the 14th a

sort of bellows-sound was heard pretty extensively in the chest; sputa viscous, white and grayish; pulse very frequent; tongue hard, dry, and cracked; heat of pharynx as before, that tube as well as the uvula somewhat less marked than usual; uneasiness and distress increased; entire face red. Slight delirium in the night. The patient expired at 10 a.m. on the 15th.

He had two liquid stools daily, but been free from abdominal pain; the head was inundated with perspiration every night.

Sectio Cadaveris; *twenty-two hours after death.*

External appearances. Nothing remarkable, except the healthy condition of the muscles.

Head. Rather considerable sub-arachnoid infiltration; superior cerebral veins distended; pia mater moderately injected; brain very firm, dotted with blood; a tablespoonful of clear serosity in each of the lateral ventricles.

Neck. Tonsils healthy; uvula somewhat thickened; epiglottis destroyed on the left side to an extent of two lines [4 millimeters] in width, and something less in breadth; mucous membrane of the larynx natural; that of the trachea bright red coloured at its lower part and of good consistence.

Chest. Lungs large, more or less violet-coloured. Left lung free from adhesions; some feeble adhesions on the right side. Tissue red and granular in the greater part of their extent, friable on the right side only, firmer at the apex than the base, furnishing on pressure a thick fluid, of the colour of lees of wine, containing a little air in the inferior part of the organ. Both contained a multitude of semi-transparent granulations, the size of which decreased from the upper to the lower parts of the lung; they were opaque and yellowish in the centre, as large as a hemp-seed towards the apex, as a millet-seed and perfectly semi-transparent towards the base. Bronchi thin; their mucous membrane healthy, except that it was violet coloured, much as is usual in subjects whose respiration has been obstructed for a considerable time before death.—Heart somewhat soft; a few yellowish patches in the aorta.

Abdomen. Rounded ulcerations, about a line [2 millimeters] in diameter, all along the œsophagus; the mucous membrane in these places completely destroyed. Stomach large; mucous membrane of orange red colour, somewhat softened in one half

of the fundus, and attenuated in some places in the same region; elsewhere uneven, mammillated, grayish coloured, presenting furrows from about one inch and two lines to two inches and four lines [3 to 6 centimeters] in length, by about a line [2 millimeters] in breadth; in these places presenting scarcely a fourth of the thickness observable in the mammillæ.—Duodenum somewhat red; not otherwise remarkable.—Small intestine perfectly healthy, except from the presence of a sub-mucous abscess the size of a pea. Mucous membrane of the large intestine likewise healthy, with the exception of some slight rednesses.—Liver softish and of buff colour.—Spleen somewhat large; the rest healthy.

Whatever be the day on which the invasion of the pneumonia really took place, the patient died of this affection and not of phthisis. But it appears to me that at a certain period, tubercles constituted the sole morbid change in the lungs,—that they gave rise to the first febrile symptoms, and were developed in an acute manner,—and lastly, that the pneumonia may be considered as the result of their rapid generation, they really acting as its exciting cause. And in truth, from the 7th to the 11th both included, that is, till the fourth day before the death of the patient, the respiration continued natural on the left side of the chest, was somewhat weak on the right, and in no situation could crepitant or any other species of rhonchus be detected. Had there at this period been a nodule of pneumonic inflammation, placed so deeply as to prevent crepitation from being audible, the force of the respiratory murmur would rather have increased than diminished at the surface of the lungs. Besides, an inflammation of such small extent as I have supposed would not furnish a satisfactory explanation of the violence of the symptoms, and more especially of the dyspnœa; the chest was sonorous over its entire extent, on the day following the patient's admission and on the 11th of October;—the hepatization was of the same character, and had reached the same stage of development throughout the substance of the lungs. For these various reasons, it appears to me that the period of invasion of the pneumonia cannot be thrown farther back than the fourth day before death; and that, consequently, the fever, dyspnœa, and cough, existing before that period, must be ascribed to the

rapid development of tubercles. This very formidable invasion of the disease, and its similitude to that of the affection described in the preceding case, seem to justify the inference that, had the existence of the patient not been cut short by the attack of pneumonia, the tuberculous disease itself would have proved very rapidly fatal.

The idea that tubercles had already existed for a certain period in the lungs, at the time when the dyspnœa and fever set in, is inadmissible; because previous to the invasion of the pectoral symptoms, the patient had enjoyed *perfectly* good health. It is not, in truth, conceivable that such a considerable number of granulations could exist without producing functional disturbance of some kind; and hence a new motive for regarding the progress of the tuberculous disease in the present instance as extremely rapid.

The inflammatory state of the larynx and the ulcerations of the œsophagus no doubt contributed, at a certain period, to the general uneasiness and distress of the patient; and to the latter is assuredly ascribable the uncomfortable sensation experienced along the neck.

The following case, which resembles very closely that just related, in regard to the immediate cause of death, is rendered more peculiarly remarkable by the rapidity of the course of the disease, this having terminated fatally after a duration of twenty days only.

Case XXXIX. A water-carrier, aged 30, of tolerably strong constitution, generally enjoying good health, with the exception of occasional colds of short duration, was admitted into the Hospital of La Charité on the 24th of January, 1826. His father and mother were still living,—the one aged seventy and the other eighty. He very rarely committed any excess in wine, and had been fifteen days ill, the last four of which he had kept his bed. Upon strict inquiry into the state of all the functions previously to that period, it appeared that they had been in a perfectly natural state. The outset was marked by a violent attack of rigors, with trembling, which recurred occasionally afterwards, considerable heat of skin between these attacks of rigors, on rare occasions slight sweating, and incessant cough. He had completely lost his appetite for the same

length of time, and had two liquid stools daily, without colic or epigastric pain; increasing failure of strength was noticed, from the first, and his extreme weakness was the cause of his having kept his bed for the last four days.

January 24th. *Present state.* After a somewhat restless night, with quiet delirium, I found the patient's face red, slightly expressive of bewilderment and stupor, the eyes brilliant and slightly injected; the hearing good, without any buzzing in the ears; legs and loins somewhat painful, as from the outset; intelligence in good condition; tongue natural at the edges, reddish and villous in the centre, moist over the entire surface; mouth clammy and bitter-tasting; appetite completely gone; thirst urgent, although cold liquids were insupportable to the patient; abdomen free from pain, naturally shaped; skin rather hot; pulse 104; sputa small in quantity, contain a good deal of air, without being viscous; the respiratory murmur presented no evident deviation from its natural state, on the right or left side anteriorly.

V. S. to eleven ounces; infusion of violets, with syrup of gum; gum potion; sinapisms if necessary.

25th. Had a restless night, talking a good deal; not loudly, however. Blood drawn yesterday not buffed. Respiration gasping; sputa as before; on both sides posteriorly, in the inferior third of the chest, and all round, rather fine crepitant rhonchus is heard; the patient complained of pain in the throat, and the velum palati was red and dry; the limbs became the seat of involuntary movements, when not stretched out on the bed at full length; several liquid stools in the course of the day.

The following night the patient was so restless that the strait-waistcoat was put on. On the 26th, in the morning, he was still delirious, made no answer to questions put to him, was indignant at being treated as a madman, and not being allowed to attend to his business. Respiration deep and frequent; fine crepitation in the lower three fourths of the left side; the same rhonchus on the right side, but limited to a surface by half less extensive; tongue brownish coloured with whitish striæ.

V. S. to nearly thirteen ounces [400 *grammes*] *; sinapisms.*

Shortly after the bleeding had been performed the patient tore away the dressings, and about seven ounces and a half more blood were lost.

The delirium continued, notwithstanding, however; and on the 27th the patient, still capable of telling his own name, had difficulty in remembering that of the street he lived in; he affirmed that he had no pain anywhere. Spasmodic movements in the limbs from time to time; pulse 120, regular; skin hot; respiration very frequent; crepitation as before; percussion furnishes a clear sound; tongue somewhat dry, not hard; abdomen yielding and natural in shape.

Twenty-four leeches behind the ears; ice to the head; sinapisms to the lower extremities.

The ice was kept on the head part of the day, and a good quantity of blood drawn by the leeches; but the delirium did not appear modified for one instant by either. The patient uttered cries part of the night.

28th. Continual spasmodic movements in the limbs for the last three hours; eyelids closed, even when he tried to stammer out some reply to the questions put him; tongue soft and natural in colour, though dry; he had great difficulty in protruding it beyond the teeth; crepitation as before, and audible in front as well as posteriorly.

Whey; ice to the head.

He became somewhat less restless in the course of the day. On the 29th he had been freed from the strait-waistcoat; the face red, and strongly expressive of bewilderment; he put out his tongue tolerably well; it was whitish in the centre and natural on the edges; he stated in a confused manner that he had no pain anywhere; the spasmodic movements were less marked than before; percussion of the chest still perfectly sonorous, anteriorly and laterally. Posteriorly on the right and left sides, humid sub-crepitant rhonchus without vesicular respiration, but mixed with fine crepitation; the latter existed also anteriorly on the left side, where it was rather abundant; pulse more frequent than usual.

The patient expired at 6 p.m.; without having had any alvine evacuation, but having passed a considerable quantity of urine, and laboured under increasing embarrassment of respiration.

Sectio Cadaveris; *thirty-eight hours after death.*

External appearances. No appreciable emaciation; forms of limbs, &c. well preserved; vibices in the back.

Head. A few glands of Pacchioni along the longitudinal

fissure. Moderate amount of sub-arachnoid infiltration; about two tablespoonfuls of clear serosity in the right ventricle, somewhat less in the left. Cortical substance of the brain perfectly healthy; medullary substance tolerably firm, presenting some red and black points in its interior. Septum lucidum natural. —Cortical substance of the cerebellum and pons Varolii somewhat higher coloured than natural.

Neck. Mucous membrane of the epiglottis, larynx, and trachea healthy; lymphatic glands around the lower half of the trachea enlarged and of reddish brown colour, free from tubercles.

Chest. General cellular adhesions, easily torn, between the left lung and costal pleura; similar ones on the right side, anteriorly, while at the base of the organ, posteriorly, appears a mass of pseudo-membrane, of uniformly dull yellow colour, obviously tuberculous, prolonged into the fissures, and increasing in thickness the further from the apex of the lung it is examined. Both organs were at once firm and yielding, except the summit of the left lung. Their surface looks, as it were, mammillated, in consequence of the numerous granulations pervading their entire substance. Whether superficially or deeply placed, these granulations were miliary and semi-transparent, inferiorly; while they increased in size, and lost their semi-transparence towards the upper parts of the organ, where they were yellowish in the centre only, or throughout their entire substance. The pulmonary tissue between the granulations was red, firm, elastic, easily torn, and non-granular, and gave out, under pressure, a red somewhat frothy fluid, in moderate quantity: true hepatization did not exist in any part of the organs, not even at the base. At the apex of the left was seated a mass of gray semi-transparent matter, about an inch and a half [4 centimeters] broad, presenting a cavity as large as the top of the middle finger in its centre, and near this cavity two others of smaller size. On the apex of the right side, where there appeared much less gray matter than on the left, were two small cavities and a softened tubercle somewhat excavated. Bronchi natural. Pericardium healthy; heart very soft.

Abdomen. Omentum moderately well supplied with fat, and not diseased in any appreciable way. No effusion in the peritoneum; the membrane as smooth as usual, and free from

viscidity; in the mesentery, on both sides of the linea alba, as also on the bladder and rectum, a considerable number of semi-transparent granulations, studded with gray points or perfectly colourless, about one or one and a half lines [2 or 3 millimeters] broad, developed on the attached surface of the peritoneum. One of them, larger than the others, was completely tuberculous. Liver of large size, pale coloured, soft, and easily torn. Gall-bladder contains a small quantity of rather thin bile, of the colour of prune juice.—Spleen of the colour of lees of wine, very soft, and deficient in cohesion.—Kidneys redder than natural; otherwise healthy. Bladder not remarkable in any way.—Stomach slightly distended with gas; mucous membrane somewhat pink coloured and softened; small intestines and colon not obviously altered in structure.—Prostate pink coloured,—Pancreas higher coloured than in the natural state.

Here, as in the two preceding cases, the invasion of the disease was sudden and distinctly marked; of this there can be no question. Hence we are compelled to admit, that pulmonary phthisis may entail death in the course of twenty days, through the influence of alteration seated in the lungs;—that twenty days suffice for the development of a great number of tubercles in those organs, for the formation of cavities, and the production of a completely tuberculized pseudo-membrane in the pleura, and gray semi-transparent granulations under the peritoneum. These alterations, it is true, serious in character and extensive as they may have been, did not of themselves produce death; here, as in the preceding case, pneumonia hastened the fatal issue, and the inflammation of the pulmonary parenchyma was excited by the tuberculous affection. There can be the less doubt about this, as I recognized the pulmonary inflammation during life, and was enabled to follow its progress, and satisfy myself that this had been far from rapid. I was enabled to ascertain too, that the inflammation had remained in the first stage almost from first to last, and that after death, the anatomical change resulting from the inflammatory action, exhibited the same characters throughout, as it would have done had the morbid action commenced at the same time in every part of the organs, a condition of things which is not observable when pneumonia depends upon other causes.

The delirium, which could not be ascribed to any appreciable alteration of the brain (that organ was healthy), depended, no doubt, upon the cause exciting that symptom in many acute diseases attended with much feverish action. It depended on the same influence as the diarrhœa which set in at the outset of the affection; at least the small intestine and colon were healthy at the time of the post-mortem examination, and it is for this reason, scarcely credible, that they could have been the seat of anatomical change of any consequence at the time of the patient's admission.

The two following cases naturally find their places here, although in these the disease advanced with somewhat less rapidity and violence than in the three preceding ones.

Case XL. A tailor, aged 19, of middle height, and tolerably strong constitution, was admitted into the Hospital of La Charité on the 4th of May, 1824. He had regular winter colds, of short duration, had never suffered from any serious disease, considered himself three weeks ill, for the last four days of which he had ceased to work. At the outset he was seized with cough, expectorated clear sputa, suffered from chilliness, anorexia, and constipation. These symptoms continued, and had acquired increased intensity the last eleven days; pains in the left side of the chest, especially in the shoulder, headache and lassitude in the limbs had supervened in addition. On the fifteenth day constipation gave place to diarrhœa; the appetite failed completely, and the patient ceased altogether to take food.

May 5th. *Present state.* Face hot, red, animated; eyes lively and brilliant; headache; he lies indifferently on the back or either side; moderate dyspnœa; cough not troublesome; sputa like frothy saliva; pain at the edge of the false rib on the left side; sound dull posteriorly in the lower half of the chest and anteriorly under the clavicle; well marked gurgling in the latter position and also at the shoulder, with imperfect œgophony; results of percussion and auscultation negative, on the right side; pulse 90, moderately strong; tongue moist, natural at the edges, yellowish gray coloured in the centre; mouth clammy; thirst rather urgent; complete anorexia; epigastrium and hypogastrium tender under pressure; three liquid stools.

Infusion of violets with oxymel ; gum potion ; v.s. to ten ounces nearly [300 *grammes*].

6th. No change ; blood not cupped, and no contraction of the clot.

The same symptoms continued, increasing in severity constantly and uniformly, till the 4th of June, the day of the patient's death.

The dyspnœa did not acquire very great intensity, nor the respiration become very frequent till the last eight days of life. Towards the middle of the month of May, the patient referred all his dyspnœa to the left side of the chest. Generally speaking, of slight severity, the cough sometimes became very violent ; the sputa more or less abundant, clear, frothy, whitish, slightly tinged with blood, at the beginning of June ; some of greenish colour and non-striated, appeared towards the close. On the 14th of May, the left side of the chest emitted no sound under percussion, below the mamma, and in the lower two thirds posteriorly ; the œgophony observed at the shoulder had given place to simple resonance of the voice, which soon after became audible lower down ; the gurgling continued occasionally ; associated with some crackling rhonchus. On the 26th, the respiration assumed the tracheal character under the left clavicle, but pectoriloquy could not be detected there. On the 28th, some little congestion appeared on the same side anteriorly.

The pulse continued rapid, rarely beating less than 100 in the minute, and became much more frequent the last eight days of life. The skin continued hot ; rather copious night-sweats took place, with, on rare occasions, attacks of rigors.

The tongue almost invariably presented the appearances already indicated ; the thirst was urgent and proportional in amount to the fever ; the loss of appetite total ; the epigastrium slightly painful during the six days following that of the patient's admission, subsequently free from pain. Between the 22d and 24th of May, the patient occasionally vomited some clear fluid, free from bitterness ; the stools were more or less liquid ; two or three being almost always passed in the day, rarely attended with colic-pains.

The loss of strength increased with rapid strides, and once the pain at the edge of the false ribs had been removed, the patient complained of nothing except his not recovering his

strength. He felt no anxiety about his state, till the closing days of life. He then lay constantly on the left side, and his excessive weakness prevented me from submitting that side of the chest to sufficient examination; respiration appeared to be natural there, however, up to the 28th of May. During the closing week, the face, generally speaking, presented a deep red colour, sometimes of crimson tint; hearing became defective, and slight delirium took place the day and night preceding death. On the 4th of June, at about 8 o'clock in the morning, the patient had recovered his understanding, was tortured with thirst, and labouring under excessive dyspnœa, drank rapidly without help; the face was bathed in perspiration, and he expired at 11 a.m.

The ptisan ordered at first, was continued subsequently; he had from time to time some broth diluted with water. On the 10th of May, he was bled a second time; the same day twelve leeches were applied around the anus, and a blister to the left side of the chest, without apparent mitigation of the symptoms. On the 31st, the increase of dyspnœa, heat of skin, and frequency of the pulse were met by another bloodletting which produced only momentary relief.

Sectio Cadaveris; *twenty hours after death.*

External appearances. Second stage of marasmus. Marked attenuation, amounting to almost complete destruction of the skin at the central part of the blister.

Head. Brain firm, slightly injected; a tablespoonful of serosity in each lateral ventricle; one tablespoonful and a half of similar fluid in the inferior occipital fossæ; the rest perfectly healthy.

Neck. Cervical glands red, large, and firm; some of them studded with miliary tubercles. Laryngeal surface of the epiglottis slightly ulcerated, and the sub-mucous tissue irregularly swollen; larynx natural. Mucous membrane of the trachea of bright red colour, more especially at its lower part, of proper thickness and consistence; it is the seat of a few ulcerations, looking as if they had been cut out with a punch.

Chest. The left lung filled the cavity of the pleura accurately; it adhered by pseudo-membranous matter to the diaphragm, was elsewhere in juxta-position with the costal pleura, firm and resisting throughout its substance, except in a portion about two inches [5 centimeters] broad, at the acute border. At the apex,

it contained a cavity of about the size of a walnut incompletely emptied; and besides an abundance of tubercles and some nodules of hepatized pulmonary tissue. The remainder of this lobe and the entire of the inferior one, were almost totally transformed into tuberculous matter, arranged in the form of masses, of more or less considerable size, which were not softened, and between which, the tenth part of the lung, perhaps scarcely even so large a portion as that, continued permeable to air. The pleura, lying directly on the tuberculous matter, was readily separable from it.—The right lung, free from adhesions, contained towards the summit a considerable number of tubercles, many of which were softened or partly evacuated even; there were none elsewhere in this lung. The anterior acute border of the upper and middle lobes were rather extensively hepatized. Left ventricle of the heart somewhat dilated; aorta natural.

Abdomen. Stomach of moderate size; its mucous tunic red and slightly softened in the fundus; below this it appeared whitish and blueish coloured, attenuated and as soft as mucus over a surface of from fourteen and a half to eighteen square inches [36 to 45 centimeters]. Here the vessels were very distinct; elsewhere, it was mammillated, more or less, and of good consistence, and almost half a line [1 millimeter] thick. In the small intestine, near the cæcum were seated semi-cartilaginiform granulations, some ulcerated, others not so, and besides some small ulcerations from one to two lines [2 to 4 millimeters] in diameter, with flat edges; and several others of greater size, measuring about three inches and three quarters square [9 centimeters]; both kinds were seated on the glandular patches of Peyer. In these ulcerated places the sub-mucous tissue was laid bare, more or less uneven and thickened, and had altogether disappeared in some points. Elsewhere the mucous membrane had all the characteristics of perfect health. The mucous tissue of the cæcum and ascending colon was fragile; in every other part of the large intestine, natural.—The mesenteric glands corresponding to the ulcerations were of large size, more or less red, and studded with miliary points of tuberculization.—Liver healthy; bile in the gall-bladder blackish and thick.—Spleen large and softened.—Other viscera natural.

When seized with cough and fever, this patient was in the

enjoyment of perfect health; consequently the invasion of the phthisical disease must be fixed for that period, and the affection must have proved fatal in fifty days. The lungs, it is true, were not the only organs diseased; but the fact that the left was almost completely transformed into tuberculous matter, while the right contained a certain quantity of that substance, warrants us in admitting that if the death of the patient was hastened by the complications existing, it was so hastened to a very trifling amount only. Without committing any very serious error then, we may regard the fatal event as the effect solely of the existing pulmonary tuberculization.

When I saw the patient first, slight œgophony existed at the left shoulder; below that point, the chest emitted no sound under percussion, the voice did not resound, and I inferred that an effusion, circumscribed by adhesions on all sides, existed in the region of the shoulder. But the post-mortem examination disclosed neither effusion, pseudo-membrane, nor adhesions in that region; so that in this instance, the cause of the œgophony escapes us, unless we admit the possible occurrence of circumscribed effusion without coexisting pseudo-membrane, or that some other conditions besides effusion are capable of leading to the generation of œgophony.

Be this as it may, the absence of œgophony below the shoulder on the twentieth day of the disease, in a place where the chest emitted no sound under percussion, and where I found the lung transformed into tuberculous matter, shows that this transformation existed at that period. This fact renders it indubitable that the tuberculous matter was deposited throughout the entire of the left lung, almost at one and the same time,—a mode of deposition which is extremely rare, and may be regarded as proper to the acute form of the disease.

It is not unworthy of note, that the ulceration of the epiglottis gave rise to no symptom. I frequently asked the patient whether he suffered from any pain in the regions of the larynx, or os hyoides, and was always answered in the negative.

Case XLI. A washerwoman, aged 23, of moderately strong constitution, born of healthy parents, and not subject to cold, was admitted into the Hospital of La Charité on the 11th of November, 1821. The catamenia had not appeared for the last

eleven months; but nevertheless her health had not suffered, with the exception of slight general uneasiness occurring from time to time, and trifling loss of strength. She considered herself ill for fifteen days. Her illness had commenced by considerable oppression of breathing, joined, on the eighth day, by sharp pain on the left side of the chest, cough, expectoration, intense heat of skin, more especially at night, loss of appetite, and thirst, Diarrhœa had set in a few days before these symptoms.

November 12th. *Present state.* Rather acute pain in the left side, increased by cough, by inspiration, and by lying on that part; frequent and often dry cough; sputa frothy and whitish; pulse tolerably frequent; great heat of skin at night; tongue moist and grayish in the centre; thirst; anorexia; three liquid stools without colic-pains.

Infusion of violets sweetened; oxymel; gum potion; twelve leeches to the genitals; poultices to the painful part.

Soon after the leeches had fallen off, the patient felt slightly relieved; the pain diminished and subsequently disappeared altogether, and she became able to lie on both sides. On the 14th, the heat of skin had diminished; the sputa were mucous, aerated, yellowish and rather viscid; the cough, severe in the evening, continued so the next day also; the pain in the side did not return; some slight appetite appeared.

16th. Expression of face less lively than usual; sputa more liquid.—17th. Respiration not frequent; pulse somewhat so still; skin scarcely hotter than natural; night-perspirations; four liquid stools.

V.S. to nearly ten ounces [300 *grammes*].

From the 17th to the 24th, there was but very little feverish action; the pulse almost natural; the cough less frequent; the sputa in small quantity, and not thick; sweating of daily occurrence; the diarrhœa less than usual; the appetite improved, the quantity of food taken being gradually increased to one fourth of the house allowance; the patient complained of nothing except of not recovering her strength.

She vomited her ptisan during the night of the 26th.—27th. Complains of bitter taste in the mouth; appetite failing; epigastrium free from pain; pulse frequent; skin moderately hot. Her allowance of food was diminished.

The same symptoms continued the following days; and

during the night of the 1st of December, after profuse perspiration, she had a violent attack of rigors, much cough and dyspnœa, and deep-seated pain behind the sternum.—2d. Sputa white and aerated; face blueish; marked prostration.

Blister to the sternum.

The symptoms grew worse till the 15th of December, the day on which she expired. On the 7th, mucous rhonchus, mixed with a sort of gurgling, was audible under the left clavicle. On the 11th, the same signs existed still, and the chest furnished no sound under percussion in the same region. Aphonia came on suddenly, and continued subsequently, unattended with any disagreeable sensation in the larynx. Pain was sometimes excited behind the sternum by the cough. On the 4th, the sputa were grayish coloured, rounded in form and opaque, and they retained the same character to the last.

Diarrhœa of greater or less abundance existed during the last ten days.

The patient said nothing and complained of nothing; she seemed absorbed by the sufferings arising from the oppressed state of her breathing, and habitually lay on the left side.

Sectio Cadaveris; *forty hours after death.*

External appearances. Commencement of the second stage of marasmus.

Brain not examined.

Neck. Larynx natural. Mucous membrane of the trachea and bronchi of a more or less bright red colour.

Chest. Right lung, perfectly free from adhesions, contains no tubercles; engorged at the base. A few cellular adhesions at the apex of the left, which was free from adhesions elsewhere, and exhibited not the least trace of pseudo-membrane. The upper lobe was almost completely converted into tuberculous matter, and contained three cavities very partially emptied. The tuberculous matter was almost uniformly softened throughout, and presented itself under the forms of masses of more or less considerable dimensions, between several of which appeared a certain quantity of gray semi-transparent matter. The lower lobe presented only a small number of tubercles; it was engorged at the base.—The heart exhibited its natural character in respect of size; the walls thinner than natural. Aorta perfectly healthy.

Abdomen. Breadth of the stomach about the same as that of the colon ; the mucous coat pale.—Twelve ulcerations, from one to two lines [2 to 4 millimeters] in diameter, in the small intestine.—Liver of large size, fatty, and buff coloured.—Kidneys livid red coloured.—Uterus healthy ; ovaries of natural size, and containing a small quantity of tuberculous matter.

When this patient was taken ill, the catamenia had been suppressed for ten months. During that period slight general uneasiness had been experienced from time to time ; but no appearance of fever, of loss of flesh, dyspnœa, or cough had been noted,—in a word, not a symptom existed, referrible in any way to affection of the lungs. The development of the pulmonary tubercles could not consequently have taken place at an earlier period than that at which the dyspnœa manifested itself ; and hence the patient must have perished on the forty-eighth day of phthisis. And this affection was very probably the sole cause of death ; for, notwithstanding the imperfection of the description given of the mucous membrane of the stomach, it is to be supposed, from its pallor and the absence of nausea, of vomiting, and of epigastric pain during life, that it was perfectly healthy. However, the promptitude with which the fatal event occurred is remarkable, inasmuch as the right lung was free from tubercles, and those productions were in the left almost completely confined to the upper lobe.

But it is the remittent course of the affection that invests this case more especially with interest, and gives it, as it were, a special character. In truth, after suffering for a few days from oppression of breathing, the patient was seized with fever, cough, expectoration, and sharp pain in the left side of the chest ; these symptoms continued with more or less severity for eight or ten days, yielding then in some measure under the influence of leeches applied to the genitals. At least the pain ceased then, the other symptoms became less severe, and after ten ounces of blood had been drawn from the arm, the fever almost wholly disappeared, the cough grew less violent, the quantity of expectoration diminished, and the digestive functions recovered their activity. This improvement lasted eleven days, and during the night of the 1st of December the patient was seized with violent rigors, accompanied with marked oppression of breathing and

general distress; the cough again became frequent, and death followed on the thirteenth day of the sudden and unexpected exasperation of the symptoms. The disease would appear on first consideration to have remained stationary for some time: still it is presumable that it was continually making some progress, and that the severity of the second outbreak was in great measure the result of rapid softening and evacuation into the bronchi of a certain number of tubercles. One thing at least is positive; namely, that the appearance of the sputa underwent a complete change from the moment the symptoms assumed their formidable character.

The pain felt in the left side at the outset constitutes a point of similitude between this and the preceding case, and shows, that where tuberculous matter is generated with rapidity, it may give rise to suffering of variable severity. In neither case, in truth, did any traces of recent pleurisy present themselves. However, it is possible that when tuberculous matter is developed *immediately* under the pleura, this membrane might in reality be the seat of the pain experienced.

The five cases just related are not, as I have already said, the only examples I have collected of acute phthisis; I have been enabled to add eight others to the list. Four of these fell under my observation before 1825, the others since that period. I shall here take a brief general survey of all these cases.

The first three cases, those in which the duration of the disease was shortest—twenty, twenty-nine, and thirty-four days—are likewise those in which the general character of the malady wore a peculiar aspect. In these cases, in truth, the invasion of the disease was sudden and violent, sufficiently similar to that of acute maladies of serious nature. These tuberculous individuals were seized, while in the enjoyment of excellent health, with rigors, and trembling more or less violent, which recurred the following days. The rigors gave place to heat of skin, which continued subsequently without interruption, and was generally as intense as in typhoid fever. From the very outset, too, the patients suffered from urgent thirst; the appetite failed completely or almost completely; the respiration grew frequent, the breathing much oppressed; and cough supervened (except in one case, that of the young girl who

perished on the thirty-fourth day of the disease, and did not begin to cough till the tenth;) the expectoration was invariably small in amount; and when the patients came under observation, febrile action, more or less violent, existed.

Now at the time of invasion of these formidable symptoms, none existed ascribable to any affection unconnected with the thoracic organs, or to pneumonia, or pleurisy; this was also the fact when the patients were admitted into hospital. So that, notwithstanding the small number of cases in which phthisis followed the rapid course now under consideration, we are justified in regarding the existence of that disease as almost demonstrated,—independently of the evidence derivable from auscultation and percussion—in cases where young subjects are seized suddenly while in the enjoyment of good health, and without assignable cause, with cough, dyspnœa, (accompanied with more or less marked acceleration of respiration, with or without pain in the side,) fever, anorexia, thirst, occasionally delirium (as in Case XXXIX),—provided these symptoms, after a few days' duration, have acquired additional intensity, although the means best calculated to combat intense feverish action were employed, and no signs of pneumonia, pleurisy with effusion, or acute capillary bronchitis of intense character existed. At a somewhat later period, auscultation and percussion, carefully practised, would remove, or, at least, might remove all doubt, unless in those exceptional and most rare cases in which tuberculization commences at the base of the lungs. (Case XXXVII.) And even here the state of uncertainty might be of only temporary duration, as the characters of the sputa, taken in connexion with the other symptoms, might lead to a positive diagnosis.

Cerebral symptoms supervening at the outset, or at least slight delirium at night, as occurred in one of the cases now under consideration (Case XXXIX), might deceive the observer, and lead him to suppose the patient affected with typhoid fever. But typhoid fever is not accompanied, at the outset, with cough and dyspnœa, at least with dyspnœa of any considerable severity; and the prostration of strength, one of the principal phenomena of the affection, is much more marked, when the febrile action is violent, than it was in the three cases under consideration. Again, subjects labouring under typhoid fever present,

a few days after the invasion, a more or less obvious alteration of the features and of the functions of the organs of sense; and the skin soon becomes the seat of the peculiar lenticular pink macula,—symptoms not observed in phthisis. Hence if a state of uncertainty may, under the particular circumstances, supposed, exist at all, each additional day tends to remove it, and the diagnosis becomes matter of positive demonstration within a short period. These cases, however, it must be admitted, require the greatest attention on the part of the physician, for their diagnosis is difficult, and it is really important not to commit an error on the subject, for the treatment of acute phthisis is not the same as that of typhoid fever, and the prognosis also differs in the two cases.

With respect to the other eight instances of acute phthisis, in which death supervened within from forty to eighty days, the invasion of the malady presented no character of peculiar violence. As far as a judgment can be formed upon the point, the febrile action was not severe at that period; but the cough was almost always very troublesome, and the appetite and strength much impaired. The cough was actually violent in one case only, and in but a single instance did hemoptysis occur at the outset. The infrequency of hemoptysis, under these circumstances, is a point worthy of note, inasmuch as, according to generally received ideas, the rapid development of tubercles should render the lungs the seat of proportionably great congestion, and so favour the occurrence of hemorrhage. But the fact is in perfect harmony with unbiassed experience; for experience proves that hemoptysis, whether setting in with the commencement of tuberculous development, or attending its progress, cannot be ascribed to congestion, properly so called; but that in truth it depends upon some conditions, inappreciable in respect to their precise nature, but of which the presence of tubercles is the most important, the most necessary, and in truth the indispensable element.

The pains in the side, which occurred in eight of the thirteen cases in question, although recent pleurisy existed in but three among the number, deserve the reader's attention. If it be not strictly inferrible from this, that in the five cases where no recent pleurisy existed, the pleura can have taken no share in the production of the pain in question, it must at least be

granted that the thoracic pains of phthisical subjects do not always depend upon inflammation of that membrane, and that the rapid generation of tubercles may, independently of that inflammation, give rise to those pains.

The anatomical changes of various kinds found in these subjects, so rapidly cut off by a disease, which commonly destroys its victims slowly, may be enumerated as follows:

In addition to the gray semi-transparent or tuberculous granulations which existed—generally speaking in great numbers—in the cases in question, all the subjects, except three, (who died after twenty-nine, fifty, and seventy days' illness,) presented cavities at the apices of the lungs. In the case terminating fatally on the twentieth day (Case XXXIX), several excavations had already formed; and here, curiously enough, the cavities were seated in the centre of some masses of gray semi-transparent matter.

A fact equally deserving attention is, that the lungs were more or less completely hepatized—generally speaking, extensively so—in nine of the thirteen victims of acute phthisis. This proves, as I have already said, that the rapid and abundant development of tubercles is a cause of pneumonia,—a conclusion to which the consideration of the symptoms had already led us.

It must not be forgotten, too, that in one case—terminating fatally on the twenty-ninth day—there were tubercles in one lung only; and that, in another, the tubercles were principally developed at the base of the organ.

The bronchi did not deviate from the natural state, except in a single case, wherein one of them, communicating with a cavity, exhibited some small ulcerations.

The trachea, larynx, and epiglottis had likewise undergone ulceration in some cases: the trachea, in three subjects, carried off on the fiftieth and seventy-fifth days of the disease; the larynx in two, dying at the same period of the affection; the epiglottis, in three others, who expired on the twenty-ninth, fiftieth, and fifty-fifth days. These ulcerations were of small extent and depth, a fact easily explicable by the short duration of the primary disease; but the proportion of cases in which they existed was considerable, and furnishes evidence of the strong tendency of the air-passages to ulceration in phthisical subjects. It is remarkable that, in every case but one, the lungs had undergone

some amount of excavation, and that the only example of ulceration of the bronchi occurred in the subject whose lung presented the largest cavity. These facts warrant us in believing, that in acute as in chronic phthisis, the material of expectoration exercises a more or less important influence on the development of ulcerations in the air-passages.

Traces of recent pleurisy existed in five subjects. The pseudo-membranes present had attained greater or less thickness in three of them, carried off on the fiftieth and sixtieth days of the disease. They had undergone tuberculization in two others, dying on the twentieth and eightieth days,—both of them curious facts, and the former seeming to justify the notion that tuberculization of pseudo-membrane is not always a transformation of a previously existing state, but that it is so developed primitively in certain cases.

No semi-cartilaginous cap invested the apex of the lungs in any of the cases before us; a circumstance showing, in conjunction with numerous other facts, that the thick, hard, pseudo-membranes, so common in phthisical subjects, are formed slowly.

In one subject, who died on the twenty-ninth day, the œsophagus had undergone ulceration.

The mucous membrane of the stomach was pink coloured, mammillated, softened or unsoftened, in three cases terminating fatally on the thirty-fourth, thirty-ninth, and fiftieth days. It exhibited a small ulceration in one individual, cut off on the fiftieth day; was perforated in another; and healthy in four cases only, or in the third part of the whole number.

The small intestine contained tubercles in one instance only: it was in six instances the seat of ulcerations, always of very small size, and in individuals in whom the disease lasted from fifty to eighty days. These latter cases afford corroborative evidence in favour of the statement already made, of the perfect independence in many cases of phthisis of intestinal ulceration and tubercles.

The large intestine exhibited ulcerations in three cases only; they were always very small, and existed in subjects carried off on the fiftieth, fifty-fifth, and seventy-fifth days; in one case, a breadth of about twenty inches [$\frac{1}{2}$ a meter] of the mucous tunic was destroyed immediately above the anus.

In three females, in whom the disease terminated fatally on

the forty-ninth, fiftieth, and eightieth days, the liver larger than natural, had undergone the fatty transformation.

The spleen was softened and enlarged in four cases.

The thirteen cases before us furnished one example of tubercles in the meninges, another in the mesentery, a third in the kidneys, and two in the ovaries.

From all this the general conclusion immediately derives, that, notwithstanding the rapid development of the disease, and its prompt termination in death, the secondary morbid changes were, setting aside the amount of each, the same in nature, and almost so in proportional frequency, in these thirteen cases, as in cases running the ordinary slow course.

Phthisis, after having set in with a certain degree of violence, sometimes becomes arrested, as it were, in its course. Examples of this kind are not rare, and we shall meet with some in the next chapter.

It is a question of extreme interest to ascertain what are the circumstances tending to hasten or retard the course of phthisis to the remarkable amount of which examples have already been passed in review. Do sex, age, or constitution exercise any influence in this direction? I have sought for answers to these questions in the investigation of facts; and, as individuals who have reached adult age sometimes fall victims to acute phthisis, while the chronic form occurs in early youth,—as individuals of both sexes, and of weak, strong, and medium constitutions, furnish instances of both modes of progress of the disease, a few cases would evidently have supplied no just inferences, and I felt the necessity of collating and comparing numbers of facts. Proceeding in the inquiry in this manner, I came to the following conclusions.

In order to ascertain, if possible, the influence of *sex* on the mean duration of the disease, I compared two series of individuals, one of them comprising ninety-seven women, and the other one hundred and thirteen men. I found that the mean duration had been twenty months in the women, and seventeen in the men,—a rather considerable difference, and of the reverse kind from that which might have been anticipated, inasmuch as phthisis being more common in females than males, it might naturally have been supposed that the sex most strongly predisposing to the disease would also have hastened its progress.

However, if we set aside all cases in which the duration of the disease exceeded one hundred months, and in which, for that reason, the precise period of origin of the first symptoms may, in respect of some individuals at least, be subject to uncertainty, the number of women is reduced to ninety-four, and that of men, to one hundred and eleven, while the mean duration becomes thirteen months and twenty-eight days for the former, fourteen months and a day for the latter. Here the mean is almost the same for both sexes; and we are justified in presuming that sex exercises no material influence on the progress of phthisis.

And if we proceed upon a somewhat different plan, and inquire what number of cases above and below the mean occurs in each series, we find that of the one hundred and thirteen cases furnished by the male sex, twenty-eight ran a course below the average duration, and that of ninety-one cases of females, sixty-five fell within the same category. Here again the proportions are almost identically the same. I may add that among the two hundred cases analysed, are eleven in which the disease did not exceed seventy-five days in duration; and that of these eleven cases six occurred in males, and five in females, the total number of the latter being somewhat less than of the former. Consequently, under whatever point of view we consider the facts, we are irresistibly led to the conclusion that sex exercises no obvious influence on the course of phthisis.

Has *age* a more marked influence than sex on the duration of tuberculous disease? The facts illustrative of this point are as follows:

In one hundred individuals, aged from fifteen to thirty inclusively, the mean duration of the disease was twelve months and twenty days.

In sixty-eight individuals, aged from thirty-four to forty-five, the disease ran a mean course of twenty-three months and sixteen days.

In twenty-six individuals, aged from forty-five to sixty, the disease lasted twenty-two months: and in eleven persons, aged at death from sixty-one to sixty-eight, the mean duration reached fourteen months only.

But the cases, forming the last series, are too small in number, to justify us in regarding the mean deducible from them

as the accurate expression of a general fact. And on the other hand, confining our attention to the other means, it would appear very probable, almost matter of demonstration indeed, that youth, which so obviously favours the development of tubercles, also hastens their progress,—and that in fact their progress is more rapid before than after the age of thirty. And this proposition will appear to the reader still more worthy of confidence, when he takes into consideration the fact that of the thirteen unselected cases, in which the disease ran so rapid a course, eleven occurred in individuals aged only from fifteen to thirty. Of the two other individuals, one was aged thirty-four and the other forty-six.

And if, as I have already done when considering the influence of sex, I set aside from the cases analysed, all those in which the disease lasted upwards of one hundred months, we shall have as the mean duration of the affection in subjects aged from

YEARS.	MONTHS.	DAYS.
15 to 30 - - - -	11	17
30 to 45 - - - -	16	20
45 to 60 - - - -	17	7

This result must carry conviction with it, from its conformity with the former.

Let us now inquire if the possession of strong, weak, or medium *constitution* exercises any appreciable influence on the progress of the affection.

The character of the constitution was carefully noted in one hundred and ninety-seven fatal cases: in fifty-six of these it was strong; moderately strong in eighty-seven; more or less weak in fifty-three;—and the mean duration of the disease in these three groups of cases was respectively:

MONTHS.	DAYS.
14	6
14	11
16	4

Hence, were the facts analysed more numerous, the conclusion would be rigorously deducible that the course of phthisis—contrary no doubt to the general opinion—is slower in weak persons than in those of strong constitution; and that in respect of the point under consideration, it is rather a matter of indifference than otherwise, whether the constitution be strong or only moderately vigorous.

If all cases in which the disease lasted one hundred months and upwards be set aside from those analysed, the mean does not change to an obvious amount. Again, the case in which the disease ran the longest course—twenty-seven years—was that of a female of delicate constitution, aged thirty-seven; and in four cases wherein death did not occur till after an illness of ten, twelve, and thirteen years, the patients were of moderately strong constitution. Hence phthisis once developed, the chances appear less in the patient's favour the stronger his constitution.

The cases of acute phthisis lend further support to this proposition; for in weakly individuals death did not in any instance occur before the fiftieth day,—whereas, it took place on the twenty-fourth in a person of medium strength of constitution, and after thirty-five days in another of strong constitution.

Another question which suggests itself is, whether age, influencing as it does to all appearance the progress of phthisis, plays any part in the slow course run by the affection in delicate persons or in those of weak constitution. This question cannot, at least in reference to the cases before us, be answered in the affirmative; inasmuch as the mean age of the weak or delicate persons in question was twenty-nine,—an age in itself capable of accelerating the progress of the disease.

Hence, far from delicacy of constitution being favorable to a rapid progress of pulmonary phthisis, the converse must, at least for the present, be regarded as more probably the fact. It is, also, presumable from this, that persons of feeble constitution are not more prone to the development of phthisis than others; this, however, cannot be made matter of rigorous demonstration, until the ratio of weak to strong constitutions shall have been determined. And were future experience to confirm the induction which I now venture to draw, there would be no great reason for surprise, inasmuch as persons of the most flourishing appearance and strong constitution, and enjoying the best health, occasionally become phthisical, although born of perfectly healthy parents.

In order to render this portion of my Researches less imperfect, I have also submitted to examination the cases of one hundred and forty-four phthisical subjects who still survived, at the period when they ceased to be under my observation.

Out of this number I found forty-four cases of strong, or very strong constitution, seventy-two of moderately strong constitution, and twenty-seven of weak constitution. Further, the most remarkable example of chronic course was furnished by the latter group of cases, in the instance of a female, aged thirty-two, who had, for one hundred and ninety months, suffered under the majority of the symptoms of phthisis; whereas the maximum duration of the disease, in persons of strong or moderately strong constitutions, was one hundred and eighty and one hundred and forty-four months.

Has *pregnancy* really the influence on the course of phthisis which it is the common habit to assign it? Does it really suspend the progress of the disease? Some cases collected by M. Andral, now some years past, appeared to show that phthisis is not influenced by pregnancy; while another series of cases, subsequently collected by the same observer, apparently led to a different conclusion: consequently, these two categories of cases supply no available inference, and there is strong motive for observers to publish all facts falling under their notice capable of assisting in the solution of the problem. The cases should be in very considerable number, such is the extreme variety in different instances of the progress of phthisis, and so imperative the necessity for a great number of facts to reply to each question put. The following case, the notes of which are due to M. Cossy, I may meanwhile relate, as an element to aid in the determination of the point. As will be seen, it is far from giving support to the common notion.

Case XLII. A mantua-maker, aged 25, of middle height, of rather weakly constitution, and inhabiting Paris for the last four years, was admitted into the Hospital Beaujon on the 26th of April 1841, and died there on the 8th of May following. Her father had died six years before of a protracted disease, during the course of which he had had cough, palpitation, and swelling of the limbs; her mother was still living and in the enjoyment of tolerable health. The patient had been rather neglected in infancy, and had subsequently often wanted the necessaries of life. She had two children, one aged five years, the other eight months. Her first pregnancy and confinement had passed favorably; she continued well also for the first three

months of her last pregnancy, from which period (about fourteen months ago) her health failed, and she thenceforth continued to suffer more or less. The invasion of her illness was marked by pains in the right shoulder and lumbar region, loss of flesh and strength, fever, profuse perspiration, and loss of appetite, but no cough. In answer to reiterated questions put in every possible variety of way, the patient invariably affirmed that she did not commence to cough until the fifth month of pregnancy; from that moment there was dry cough, with the exception of some few bloody sputa, and from the moment the earliest symptoms manifested themselves until her confinement (that is for a period of six months), she was obliged to keep her bed. Soon after her confinement, which was in no way remarkable, she resumed her ordinary avocations, although weak and annoyed with cough and diarrhœa; she had some appetite then, however. These symptoms, combined, with irregular attacks of rigors, profuse night-perspirations, and occasional nausea, prevented her from continuing to work for more than three or four months, after which she was obliged to keep her bed. She had not spit until two months before her admission; and during those two months it was that emaciation made most rapid progress.

27th April. *Present state.* Emaciation rather marked than otherwise; intelligence well developed; memory excellent; voice cracked and hoarse, as it has been for some time; moderate dyspnœa; cough tolerably frequent, accompanied with abundant expectoration of greenish opaque sputa. On the right side of the chest occasional pain, ill defined in respect of limits, of moderate intensity; dull sound and prolonged expiration over a surface measuring two inches [5 centimeters] from above downwards, under the right clavicle; sound equally dull in the corresponding region posteriorly, bronchial respiration, bronchophony, and some crackling rhonchus. The same phenomena, with the exception of dullness of sound, exist on the left side. Moderate thirst; complete loss of appetite; tongue moist; deglutition easy; abdomen rather flat, as it usually is; the liver, protruding two inches [5 centimeters] beyond the ribs, is free from pain and local prominence; pulse moderately frequent and regular; considerable debility. No rigors had occurred within the last fifteen days.

Rice ptisan, with syrup of gum; two soups.

From the 28th of April to the 5th of May (the day of death) the patient vomited rather copiously every day; she had diarrhœa, and died without any new phenomena declaring themselves.

The body could not be examined.

Notwithstanding the deficiency of post-mortem evidence here, there can be no sort of doubt as to the nature of the affection to which the patient fell a victim. It would be difficult even to doubt that the liver, which was enlarged, and free from pain, had undergone the fatty transformation, &c. It clearly appears too, on the one hand, that pregnancy did not throw any obstacle in the way of the development of tubercles, as they originated during its existence; and that, on the other, the disease more especially affected the general health of the patient during pregnancy, inasmuch as she was obliged to keep her bed during the last six months of the present pregnancy, which she had not done in the previous one.

Acute affections, especially those implicating the lungs themselves, unquestionably rank among the conditions, the influence of which on the course of phthisis it would be most important to ascertain. There are assuredly few medical men, who do not feel persuaded, in accordance with the notions generally prevalent respecting the causes of phthisis, that pneumonia, supervening during the course of that affection, accelerates its progress. Nevertheless, nothing can be less positively established than this; for although I am unable here to give an analysis of numerous examples of the complication in question, and so supply a sort of demonstration of the fact, I have seen numbers of patients seized with pneumonia, of variable severity, during the course of tuberculous disease, and in whom the latter did not advance more rapidly after the cure of the pneumonia than before. One of the most remarkable illustrations of the point, I have met with, is supplied by the following case.

Case XLIII. A young girl, aged 18, of strong constitution, with chesnut coloured eyebrows, and hair in considerable abundance, and good colour in her cheeks, was admitted into the Hospital Beaujon on the 17th of June, 1840. She

had inhabited Paris from the age of sixteen, and began to menstruate at that period; since which she had frequently suffered from headache, flushing in the face and head, and palpitation. These symptoms had occurred with greater frequency the last five weeks, without being continuous; and the patient had also experienced, at about the same time, or eight days later, pain at the bottom of the sternum and some slight cough; and shortly after had an attack of hemoptysis, during which she brought up a tumbler-glassful of blood in a few hours. From that period the cough ceased almost completely, and it was on account of a return of palpitation and dyspnœa that the patient came to the hospital on the 16th of June.

She had then lost flesh to a slight amount, but did not look ill; the chest emitted a clear sound on percussion; the respiratory murmur was less soft under the right ear than the left clavicle, and also on the right side, behind the corresponding regions; no rhonchus nor bronchophony; pulse 90. The patient left the hospital on the 29th of June, feeling herself then tolerably well. The respiratory murmur retained the character detected on the 16th, at the apex of the right lung.

The patient rapidly recovered the little flesh she had lost, and continued perfectly well till the month of January, 1841, taking little care of her health; she was among the crowd following the funeral of Napoleon (December, 1840), and notwithstanding the severity of the weather she felt no inconvenience from it. However, she caught cold and lost flesh slightly, in the middle of January; and on leaving a masked ball, where she had danced the whole night of the 17th of February, being lightly covered, was seized with chill, and, on the same day, with pain in the left side of the chest, rigors and expectoration, and increase of cough. She was again brought, at her own request, to the Hospital Beaujon.

February 20th. *Present state.* Dorsal decumbency; general uneasiness and distress; malar bones high-coloured; answers to questions often confused; respiration frequent and hurried; pain at the sternum and all over the back; cough rather frequent; a few viscid, semi-transparent, chamois-leather coloured sputa; percussion-sound somewhat less clear at the apex of the right than the left lung, with abundant large sub-crepitant rhonchus; posteriorly, on the left side, dull sound, bronchial

respiration, and bronchophony over the lower three fourths; pulse 108, full, regular; skin hot.

V. S. to thirteen ounces nearly [400 *grammes*].

February 21st. The dyspnœa, uneasiness, and pain diminished; sputa and pulse unchanged; anteriorly, on the right side from the clavicle to about two inches and a half [6 centimeters] below the breast, moist, large, abundant sub-crepitant rhonchus; posteriorly and inferiorly on the same side small-sized sub-crepitant rhonchus, changing into crepitant rhonchus at the middle part of the chest, where it ceases,—no bronchial respiration, nor bronchophony. At the left apex, posteriorly, bronchial respiration, with crepitation, which becomes very superficial at the middle part of the chest.

Four grains and a half [3 *decigrammes*] *of tartarized antimony in about six ounces* [180 *grammes*] *of infusion of orange leaves.*

23d. The dyspnœa, distress, and pain have almost completely disappeared; sputa as on the previous day; pulse 88; sub-crepitant rhonchus on both sides, posteriorly, over the entire surface, limited to the right side anteriorly.

Pergat.

Vomiting of bitter matters took place in the course of the day; several liquid stools.

23d. Pulse 80; no trace of bronchial respiration on the left side, posteriorly; on the right side posteriorly, less sub-crepitant rhonchus; slight bronchophony at the apex.

Three grains [2 *decigrammes*] *of tartarized antimony.*

24th. Slight prostration; sputa flocculent; whitish, of large size, ragged, in the midst of a great deal of saliva; sub-crepitant rhonchus somewhat less abundant and less moist, still spread over as wide a space as before, on the right side, anteriorly, with puffs of crepitant rhonchus on the same side, posteriorly, at the apex; pulse 80.

One grain and a half [1 *decigramme*] *of tartarized antimony; a few spoonfuls of broth diluted with water.*

26th. Face sunken; cheeks hollow; intellectual faculties unaffected; tongue dry and brown; lips and teeth encrusted; skin moderately hot; pulse 112. Brownish coloured slough over the os coccygis, surrounded with a light red areola; syphilitic ulcerations on the internal surface of the labia externa, near the posterior commissure.

Infusion of violets with syrup of gum ; gum potion ; three half-portions of broth.

27th. Posteriorly, on the left side, percussion-sound almost natural, a little sub-crepitant rhonchus inferiorly. On the right side, anteriorly, sub-crepitant rhonchus from base to summit. Copious diarrhœa since yesterday ; the rest as before.

Gum potion; with about half a grain [3 *centigrammes*] *of opium; pergat.*

The prostration continued without particular change until the 2d of March.

March 2d. The slough separated from the coccyx ; the red areola surrounding it is actually erysipelatous, covers both nates, and extends to the lower part of the lumbar region ; the limits of the redness were sharply circumscribed, and the skin within them distinctly thickened and hardened.

Pergat.

4th. The erysipelas has spread to the upper part of the dorsal region, extends round the lateral regions of the pelvis, the loins, and part of the left side of the abdomen ; tongue still dry ; the diarrhœa continues ; respiration 24 ; pulse 116 ; she coughs seldom ; slight delirium in the night.

Pergat.

From the 5th to the 8th. The erysipelas, constantly spreading, eventually reached the lateral parts of the face, and upper part of the thighs, disappearing, at the same time, from the parts first affected ; the slough separated completely, leaving behind it a surface of good colour, measuring upwards of an inch and a half [4 centimeters] in diameter. Tongue dry, occasional vomiting of bitter matters; the diarrhœa continues; cough not troublesome ; prostration still considerable ; face pale, and somewhat earthy coloured ; pulse 120.

Rice ptisan, with syrup of gum ; lemonade ; gum potion ; fever diet.

March 12th. The entire face erysipelatous ; the erysipelas, on the other hand, is dying away in the lower parts of the body, and stops at about two inches and a half [6 centimeters] below the knees.

18th. The erysipelas completely gone ; weakness less than before ; tongue partly clean ; appetite keen, although there is slight diarrhœa ; sputa whitish, moderately abundant ; cough

not at all frequent; abundant, moist, sub-crepitant rhonchus, heard over an extensive surface anteriorly on the right side; no trace of it posteriorly on either side, where the bronchial respiration has completely disappeared; pulse and heat of skin natural.

From this period to the close of April, the symptoms gradually improved, and from forty to fifty small subcutaneous abscesses, as large as good-sized boils, formed in the lower extremities and trunk, more numerous in the neighbourhood of the mammæ than elsewhere. They were all opened with the lancet, contained sanguinolent pus, and healed in the course of four or five days.

April 29th. The patient staid up part of the day, began to recover her flesh, suffered neither from dyspnœa, nor pain in the chest, and coughed so little, that at first she declared she did not cough at all; the percussion-sound was not obviously duller under the right than the left clavicle; under the right clavicle the inspiratory murmur was somewhat dry, the expiratory sound marked. Posteriorly and at the apices the respiratory murmur was somewhat dry; and occasionally slight bronchophony, and a bubble of mucous rhonchus was audible on the right side. The patient at this time had three quarters of house-allowance daily, and left the hospital at the beginning of May, feeling herself then very well.

Three months afterwards this young girl again consulted me for some slight indisposition. I examined her chest, and again detected some bubbles of mucous or sub-crepitant rhonchus, at the right apex, with dry respiration, and very slight bronchophony. She presented all the outward appearances of the most perfect health, and worked in a shop from the time she had left the hospital. I saw her again fifteen months later. Within this latter period she had borne a tolerably strong child. Capillary bronchitis, of slight intensity, brought her on this occasion to the hospital; she left in some days after in very good health, and with her chest in the state described.

When I saw this patient for the first time, four or five weeks after the invasion of the tuberculous disease, slight alteration of the respiratory murmur was already to be detected at the apex of the right lung. Eight months later the local symptoms had acquired a more marked character, pneumonia having at

the same time appeared at the opposite side. The inflammation ran its course with rapidity; and before resolution was completely accomplished, a slough formed on the sacrum, accompanied with erysipelas of the surrounding skin,—which erysipelas quickly spread over the entire surface almost; frequent vomiting and diarrhœa came on, with febrile action of some intensity. Nevertheless the patient gained her strength quickly, and left the hospital in a very satisfactory state two months and a half after admission; and both at that period, and a year and eight months later, the local disease continued in very closely the same state as before the outset of the pneumonia. This single case supplies numerous inferences of importance.

On the one hand, pneumonia supervenes after a chill, in a phthisical subject, in whom the tubercles are, it is true, few in number, and not advanced in development; and this pneumonia terminates rapidly and favorably. On the other hand, the phthisical disease, which at first appeared far advanced at the outset of the pulmonary inflammation, continued eighteen months after the resolution of the latter affection, very much as it had been before its invasion; so that it is perfectly clear that inflammation did not hasten the progress of the tuberculous affection. The same is true of the erysipelas, although it spread over nearly the entire surface of the body, and manifested itself at the moment the resolution of the pneumonia commenced. This case, while it exhibits as it were the tenacity of the course of diseases, is not among the number of those (as will no doubt be admitted) which may warrant much hope from the action of therapeutical agents in phthisis. A fact, perhaps, of still greater importance than those already pointed out, is, that the large-sized, extensive, and abundant sub-crepitant rhonchus, resembling gurgling, and seated under the right clavicle, during the existence of the pneumonia on the left side, cannot be considered as furnishing an accurate measure of the extent of local diseases in phthisical subjects, inasmuch as that rhonchus, which disappeared rather rapidly, was not replaced by others significative of any anatomical change of importance in the majority of places where it had been heard. I may add that certain facts, related in connexion with the subject of the treatment by chlorine-inhalation, will remove all possible doubt as to the justness of the latter observation.

I now pass to the consideration of certain cases of sudden and unexpected death. In some of these cases the fatal event was explained by the phenomena revealed on post-mortem examination; in others on the contrary, the most scrupulous investigation of the state of the different organs led to no positive result: hence the necessity of dividing these Cases into two very distinct classes.

SECTION II.—CASES OF SUDDEN DEATH.

§ 1. *Cases of Sudden Death, explicable in a more or less plausible manner by the state of the organs after death.*

Case XLIV. A jeweller, aged 22, of small stature, exempted from military service, on account of his feeble constitution, had been four years ill when admitted into the Hospital of La Charité, the 10th of April, 1823. His illness had commenced with slight cough, accompanied with expectoration; both symptoms had continued without interruption, and became very troublesome for the last seven months, at the commencement of which oppression of breathing, rigors every day, and night-sweats had set in. During the last three days of the month of March he suffered from a rather sharp pain in the left side, with increase of dyspnœa. For the last year the appetite had failed; general uneasiness, with fullness at the epigastrium, occurred frequently, and the patient had rapidly lost strength. Neither diarrhœa nor hemoptysis had occurred.

April 11th. Face natural; not much loss of flesh; slight oppression of breathing, referred by the patient to the epigastrium; cough frequent by night; sputa greenish, opaque, ragged, in the midst of abundant pituitous matter; sound very dull at the upper and external part of the right side of the chest, clear elsewhere; respiration natural at the left side, tracheal under the right clavicle, accompanied with tolerably fine crepitation at the central part of this latter side before and behind; pulse not frequent, regular; tongue moist, somewhat villous in the centre, natural at the edges; almost complete loss of appetite; bowels rather confined; abdomen free from pain. The patient made no complaint, except of slight uneasiness at the epigastrium.

Iceland moss ; gum potion ; julep ; quarter of house-allowance.

21st. Sound of the right side dull over a somewhat more extensive space than on the 11th ; appetite improved ; the patient can now eat the quarter of house-allowance, without experiencing a sensation of weight at the epigastrium ; stools regular ; no perspiration.

Blister to the right side of the chest.

On the following days pain in the throat came on ; he lost all appetite ; the skin grew hot ; and on the 26th I observed a slight eruption of red, non-prominent spots all over the surface of the body ; desquamation already commenced in some places ; the pain in the throat had ceased for two days ; the pharynx and tonsils natural; the pulse more frequent and fuller than usual ; the dyspnœa somewhat increased ; the loss of appetite continued ; the cough brought on nausea.

27th. Eruption entirely gone ; pulse 100, full ; respiration hurried ; the patient complains of pain in the left side near the edge of the ribs, which had already existed for three days ; sound of the chest clear over the entire of this side, and the respiration natural ; results of auscultation and percussion the same as before on the right side ; sputa not obviously changed ; tongue natural ; one stool of tolerable consistence.

28th. The respiration not appearing to me more obstructed than on the previous day, I did not examine the patient at all closely. In the evening at dinner-hour, he sat up in his bed, and asked for food, and a few minutes after expired without a struggle ; the other patients did not perceive any change for the worse from half an hour before.

Sectio Cadaveris ; *twenty hours after death.*

External appearances. Muscles in good condition ; first stage of marasmus just commencing ; some vibices in the limbs more especially.

Head. Several small fissures in the dura mater giving passage to glands of Pacchioni ; cerebral veins distended with blood ; brain and cerebellum very much injected ; three small spoonfuls of clear serosity in each lateral ventricle.

Neck. Larynx natural. Mucous membrane of the trachea red and thickened over a surface upwards of one inch and a half [4 centimeters] in breadth below the chordæ vocales ; lower down the membrane became healthy, and again grew bright red

at about two inches and a half [6 centimeters] above the bifurcation.

Chest. Cellular adhesions of the right lung and costal pleura at the base; at the apex a semi-cartilaginous pseudo-membrane from one to three lines [2 to 6 millimeters] thick, which, turning inwards over the interlobular pleura, formed the greater part of the walls of a vast cavity, seated in the apex of the upper lobe of the lung, and communicating with other cavities of small size. The texture of this pseudo-membrane varied in different places; there it was grayish and blueish coloured, cartilaginiform; here yellowish, and bearing a certain resemblance to the yellow ligaments; in some places it had undergone transformation into gray semi-transparent matter. The lower lobe, somewhat engorged, contained a tolerable number of gray granulations.—The left lung was generally adherent over its entire surface; of large size, harder at the lower than the upper part, where there were some small imperfectly evacuated cavities and gray semi-transparent granulations. The tissue in the lower two thirds of the organ exhibited a blueish gray colour, and the surface of incisions made through it looked slightly granular; under pressure it gave out a certain quantity of opaline grayish fluid, almost wholly free from air.—Heart rather large, otherwise healthy.

Abdomen. The stomach contains a good quantity of turbid fluid: the mucous membrane presents red blotches in some places, was somewhat softened in the fundus, and perfectly healthy elsewhere.—Duodenum natural.—Several of the glandular patches in the small intestine red and ulcerated to various depths.—The large intestine contains a great deal of mucus and very little fæces: ulcerations of small extent in the ascending colon, the majority of them presenting tuberculous granulations in their centre; mucous membrane thickened and separated from its connexions round them: everywhere else in the natural state.—Several of the mesenteric glands somewhat red and enlarged; the other abdominal viscera perfectly healthy.

The right lung was in great part, and the left lung almost throughout its entire mass, incapable of sustaining respiration. The left lung presented the characters of hepatization, and the rapidity with which this hepatization took place explains the prompt and unexpected occurrence of death. In truth, thirty-

six hours before the fatal event, the entire of the left side of the chest emitted a clear sound under percussion; consequently the passage from the healthy state to the second stage of inflammation, must have been effected throughout the entire, or the greater part of the left lung in the course of thirty-six hours,—an occurrence which is by no means particularly extraordinary, and one repeatedly observed under other circumstances. If it be supposed, in consequence of the existence of pain four days before death, that some amount of inflammation existed at that period in the pulmonary parenchyma, I must admit the probability of the fact having been so; but this *supposition* does not even qualify the fact, that the hepatization formed in a very short time (perhaps even in twenty-four hours) throughout the greater part of the affected tissue.

Nevertheless it appears to me difficult to supply satisfactory answers to the very natural questions, how an alteration of structure, produced with such rapidity, could have entailed symptoms so unimportant, and why death should have occurred in the unexpected and sudden manner in which it actually did.

Among the other circumstances of this case possessed of some interest, I may allude to the existence of the sort of cap of composite tissue investing the apex of the right lung, and the almost perfect soundness of the mucous membrane of the stomach, although the patient had long suffered from disturbance of the digestive organs.

Case XLV. A servant, aged 32, was admitted into the Hospital of La Charité on the 15th of April, 1822, having been then ill for sixteen months. He was of contracted form and small stature, very subject to catch colds, both before and after an attack of pleurisy, which occurred when he was twenty-five years old. He ascribed his present illness to chills to which he had been exposed during a journey undertaken in the winter of 1820 and 1821. From that period he had coughed and suffered from obstructed respiration; expectoration did not commence till seven months after the invasion of the cough; emaciation set in at the same period, and about three months later night-perspirations came on, and subsequently recurred every night. During the last three weeks pain in the throat and diarrhœa had come on; no hemoptysis had ever occurred.

16th April. *Present state.* Countenance natural rather than otherwise; cough not frequent by day, troublesome at night; sputa greenish coloured, opaque and non-striated; chest sonorous over its entire surface; marked resonance of the voice under the clavicles; imperfect pectoriloquy between the spine and right scapula; voice changed in character, hoarse and cracked, very much as it has been for the last two months, without pain in the larynx; pulse frequent, full and strong; skin not very hot; no rigors for the last eight days; anorexia; pain in the throat; redness of the free border of the velum palati, and also in the pharynx; deglutition easy; no pain in the epigastrium; four liquid stools within the last twenty-four hours.

Iceland moss; gum potion; quarter of house-allowance.

26th. Complete aphonia, sensation of heat with pricking pain in the larynx; redness of the free border of the velum palati and of the pharynx; deglutition obstructed somewhat; three very soft stools; profuse perspiration.

Twelve leeches to the anus; blister to the neck; infusion of violets with syrup of gum; gum potion.

May 10th. The aphonia continues, but the pain in the larynx is less severe than usual; fluids escape in part through the nose, when an attempt is made to swallow them; no pain along the neck; under the right clavicle and in the corresponding region posteriorly a large dry rhonchus is audible, and with each word pronounced by the patient the air appears to enter the stethoscope; a few rusty sputa; pulse not very frequent; skin moderately hot; tongue natural; appetite small; abdomen free from pain; slight diarrhœa.

On the 11th and 12th no change, at least of any obvious kind, took place; nor on the 13th had any occurred, yet he was found dead two hours after the visit. He had been ordered to take a *mucilaginous mixture with syrup of poppies, and three rice creams.*

Sectio Cadaveris; *twenty-three hours after death.*

External appearances. Nothing remarkable.

Head. A little perfectly clear serosity in the upper part of the arachnoid; one tablespoonful of similar fluid in each lateral ventricle; brain slightly injected.

Neck. Œdema of the lips of the glottis somewhat more marked on the right than the left side, producing an elevation

on the latter side of about two lines and a half [5 millimeters]; mucous membrane of the larynx pale and natural. Immediately below the chordæ vocales appeared two ulcerations, measuring three lines [6 millimeters] in diameter; and about two inches and five lines [6 centimeters] above the bifurcation of the trachea, seated over its fleshy portion, was another ulceration four lines [8 millimeters] broad, by eight lines [16 millimeters] long; the intermediate mucous membrane perfectly healthy.

Chest. Cellular adhesions of the right lung to the costal pleura; a vast cavity at the apex, lined with a pseudo-membrane, consisting of two layers, the external of which lay on healthy pulmonary parenchyma or on white, yellowish, or grayish granulations,—productions which existed in tolerable number in the rest of the organ. Partial adhesions at the apex of the left lung, where also some tuberculous cavities existed. Elsewhere this lung presented those zones of gray semi-transparent matter, a line and a half [3 millimeters] broad; separated from each other by strata of slightly engorged pulmonary tissue of the same dimensions. The gray matter contained a great quantity of whitish and yellowish miliary granulations, scattered through its substance.—Heart and aorta healthy.

Abdomen. Mucous membrane of the stomach somewhat violet coloured in the fundus; natural elsewhere.—That of the small intestine presents some reddish and brownish spots, and in its lower fifth several ulcerations, in the majority of which the muscular tunic is laid bare.—Mucous membrane of the descending colon red; three ulcerations of inconsiderable size in the ascending and transverse colon.—Liver somewhat gorged with blood; the other abdominal viscera natural.

Surveying the conditions of the principal viscera as just described, we find in the brain, effusion of serosity into the lateral ventricles, much less in amount than in numerous cases, wherein death occurred unattended by any remarkable circumstance; so that obviously we cannot in the present instance refer the patient's death to that effusion. The state of the lungs was such, that to all appearance they might have continued to discharge their functions for a considerable period. The same may be said of the abdominal viscera; so that we are so far without any explanation of the sudden occurrence of

death. The œdema of the glottis remains to be considered. It will, perhaps, be urged that this œdema was not sufficiently marked to produce suffocation, and in support of the objection it may be said that no mention is made in the history of the case of the paroxysms of dyspnœa, characteristic of that affection. A case which fell under my observation some months ago supplies an answer to this objection. It was that of a young man, labouring under typhoid fever, who died in a state of frightful suffocation, accompanied with sibilant inspiration: these symptoms supervened two hours only before death; and on examination of the body I found the glottis œdematous and the œdema of about the same amount as in the case now before us. Something of the same kind *may* then have occurred in this case during the two hours elapsing between the time of the visit and the death of the patient; but it was impossible for me to verify this.

I shall not dwell further upon a conjecture, the justness of which may very reasonably be contested; but observe, in relation to the present subject, that I have only met with two other examples of œdema of the glottis in phthisical subjects, in both of which the affection was still less marked than in that just related. The rarity of the morbid state in question might appear singular, when considered in connexion with the frequency of ulcerations of the epiglottis and larynx in these patients: however, it is to be recollected that œdema is not common round ulcerations in the intestine, stomach, or other parts in phthisical subjects; a circumstance appearing to indicate that the organic process leading to the formation of these ulcerations is, generally speaking, completely local, and does not extend beyond their edges.

The mode of deposition of the gray matter in zones in the left lung is, anatomically considered, worthy of notice from its comparative rarity.

§ 2. *Cases of unexpected Death, which are not explicable by the condition of the organs after death.*

Case XLVI. A mantua-maker, aged 23, of rather strong constitution, generally enjoying good health, not subject to colds, and never having had any serious illness, was admitted into the Hospital of La Charité on the 23d of June, 1823. She

had coughed without interruption for the last five months; during the first two of which the cough had been dry; with the commencement of the third, expectoration set in, as did likewise oppression of breathing; there had been neither hemoptysis, thoracic pain, nor rigors; but the patient had been very sensitive to cold from the first, and had night-perspirations for two months. The appetite had failed greatly within the same period; she suffered from uneasiness at the pit of the stomach when she eat anything except soup; she had diarrhœa, and was losing flesh rather rapidly.

24th. *Present state.* Face tolerably animated; cough frequent at night; sputa greenish, opaque, more or less ragged; covered with saliva and clear mucous matter; breathing rather oppressed; dull sound, gurgling and tracheal respiration under the left clavicle; manifest pectoriloquy in the corresponding point behind; pulse somewhat more frequent than natural; night-perspirations; tongue somewhat villous and whitish; bitter taste in mouth; appetite almost completely gone; abdomen yielding, and free from pain; three liquid stools, passed with a sensation of burning heat.

July 3d. Pectoriloquy on both sides, between the shoulders; face fresh-coloured, and rather animated; pulse frequent, small, and weak; perspiration and the state of the digestive functions as on the first day.

5th. The patient walked in the garden, and was very gay during her walk.

6th. At 4 p.m., after having had a motion, and been put back to bed, she died suddenly, to the great surprise of the occupants of neighbouring beds, as they had just before been conversing with her.

Sectio Cadaveris; *thirty-seven hours after death.*

External appearances. Commencement of the second stage of marasmus; numerous vibices all over the surface of the body.

Head. Very slight sub-arachnoid serous infiltration; brain somewhat injected; three small spoonfuls of limpid serosity in the lateral ventricles, and about the same quantity at the base of the brain.

Neck. Larynx in the natural state; lower part of the trachea of bright red colour. Several of the cervical glands on the left side tuberculous.

Chest. Cellular adhesions at the apices of the lungs; some tuberculous cavities in these situations, somewhat larger on the left than the right side, of about the size of a small walnut, lined with a thick and firm pseudo-membrane, and surrounded with gray semi-transparent matter, studded with yellowish tubercles in more or less abundance; in such manner that a mass, measuring upwards of three inches [8 centimeters] in breadth, of the apices of both lungs was indurated. Elsewhere, gray semi-transparent granulations appeared in abundance. The bronchi throughout the upper half of the left lung were dilated without being thickened. The lymphatic glands round the principal bronchi and trachea were partly tuberculous.—The heart was somewhat soft, and contained no blood; the aorta red throughout its entire tract.

Abdomen. Stomach of moderate size, perfectly free from bile; mucous membrane coloured of a slightly livid red around the cardia and over a great part of the fundus, where it was slightly softened; elsewhere healthy.—Mucous membrane of the small intestine red throughout the portion lying in the pelvis, of proper consistence from one end to the other, and free from ulceration. Near the cæcum a few unsoftened tuberculous granulations, as large as hemp-seeds, lay underneath it.—Mucous membrane of the large intestine, slightly thickened and softened, presents some small ulcerations in the transverse colon.—The right end of the liver somewhat gorged with blood; bile contained in the gall-bladder moderately viscid and of mahogany colour. The other abdominal viscera healthy.

No doubt, in this case, the amount of disease in the lungs was considerable; but a fair portion of those organs was still permeable to the air, and respiration performed with regularity a few minutes before death. Between that time and the moment at which life suddenly ceased, no change, at least of an appreciable kind, appears to have been effected in those organs. How, then, can we explain the unexpected death? Is it justifiable to compare the viscera with the locomotive muscles, and admit that under certain circumstances they become suddenly incapable of performing their functions from a kind of fatigue?

The morbid changes existing in the other viscera were too slight to require any particular consideration.

Case XLVII. A woman, aged 60, was admitted into the Hospital of La Charité on the 14th of July, 1823. She was of strong constitution, generally enjoyed good health, seldom caught cold, and had been ill for seven months. During the first six weeks she suffered from general uneasiness, lassitude, and considerable loss of appetite, followed by cough and more or less copious expectoration. For the last three months, there had been oppression of breathing, and soon after the commencement of this, troublesome flushes of heat all over the body, and pain in the right side of the chest. These symptoms had continued; the appetite had improved of late, somewhat; there had been no hemoptysis, diarrhœa, colic-pains, nor rigors.

July 15th. *Present state.* Face pale and emaciated; loss of strength rather considerable; quiet sleep; sensation of oppression referred to the situation of the ensiform cartilage; cough not frequent; sputa ragged, greenish and opaque; dull sound, tracheal respiration and pectoriloquy under the right clavicle, and on the same side in the corresponding region posteriorly; doubtful pectoriloquy on the left side; elsewhere, respiratory murmur rather strong, accompanied with rhonchus of grave tone; pain in the right side of the chest from time to time; pulse very frequent; tongue clear and moist, somewhat red; appetite poor; epigastrium and the rest of the abdomen free from pain unless under forcible pressure; bowels moved daily; urine scalding.

Iceland moss; gum potion; one quarter of house-allowance; a cup of wine.

The appetite improved somewhat the next few days; neither rigors nor diarrhœa occurred, and the patient took some walking exercise almost every day.

25th. At the morning visit, she did not appear to me worse than usual. She took her usual walk in the course of the day; in the evening the face became somewhat violet coloured; she fell into a quiet sleep, however; at midnight she awoke, complained of a feeling of suffocation, and at 1 o'clock was found dead.

She had complained the two previous days of disgust for food, and had occasional nausea.

Sectio Cadaveris; *thirty hours after death.*

External appearances. Slight œdema of the right leg and thigh; some vibices here also; femoral veins perfectly free from obstruction.

Head. Dura mater ossified over a superficial surface of three inches and and eight lines [9 centimeters] at the posterior part near the falx; sub-arachnoid tissue very much infiltrated with serosity; choroid plexus transformed into hydatidiform vesicles, filled with serous fluid, of which no trace appeared in the ventricles; brain somewhat injected.

Neck. Larynx, trachea, and epiglottis natural.

Chest. The upper half of the right lung adhered to the costal pleura, contained at the apex a large cavity communicating with others of much less size; all of them were surrounded by gray semi-transparent matter, in the midst of which appeared a vast number of tubercles; there was not a particle of healthy tissue in this part of the organ, and the rest contained a rather considerable number of gray and yellowish granulations, and was slightly engorged.—There were only slight adhesions on the left side, and a few tuberculous cavities at the apex; slight engorgement at the base of the lung.—Heart small and healthy; aorta wide, exhibits numerous yellow patches on the surface, in the substance of its walls.

Abdomen. Numerous miliary semi-transparent granulations in the midst of an extremely delicate pseudo-membrane of cellular aspect, investing the small intestine and mesentery. Stomach slightly contracted; mucous membrane red and slightly softened in the fundus, grayish coloured, and of good consistence elsewhere.—Some ulcerations of moderate size in the lower twenty-nine inches [2 meters] of the small intestine; the free surface of these was in many cases formed of the muscular tunic, studded with tubercles; elsewhere the mucous membrane was unaffected.—Mucous tunic of the ascending colon softened; perfectly healthy throughout the remainder of the large intestine, except above the anus, where there were three small ulcerations.—Mesenteric glands natural.—Liver of small size, red coloured and friable. Twelve small calculi, studded with sharp points on the surface, lay in the gall-bladder, in the midst of a small quantity of bile of tolerably deep colour, which filled the gall-bladder.—Spleen excessively softened, of ordinary size, reduced by slight pressure to a mass of white reticulated tissue.—Kidneys red; mucous membrane of bladder injected.—A small fibrous tumour in the midst of the tissue of the uterus, which organ was of slightly pink colour.

The cause of death does not appear to me more easily determinable in this than in the preceding case, and the same remarks are in great measure applicable to both. In the present instance, in truth, the greater part of one of the lungs was still permeable to the air.—The alteration of the stomach limited both in superficial dimensions and in depth,—the ulcerations of the small intestine inconsiderable,—and the mucous membrane of the colon softened to a very limited extent only: in a word, the organic changes were much less extensive in the lungs, and in the other organs, than in many cases in which death occurs slowly, and is preceded by protracted struggle (agonie). I do not speak of the slight engorgement of the lungs, the kidneys, the liver, the intestine, and the mucous membrane of the bladder; for these conditions were probably the effect and not the cause of the kind of death under consideration, and might, to a certain extent, be compared to the vibices existing in the skin. Nor shall I dwell at all upon the redness and slight softening of a portion of the mucous membrane of the stomach, appearances in all probability of recent origin, and possibly the cause of the disgust for food experienced by the patient two days before death, and of too trifling importance to have had any great share in destroying life.

I have, in another part of this work, related a case of sudden death of the same kind as those given in the present section, which occurred in a subject almost all of whose viscera were more or less extensively diseased. (Case VII.) Under these circumstances, it is at once matter of surprise that the patient should have survived so long, and that death should have occurred without being preceded by the symptoms commonly observed. In a fourth case (resembling those which precede in respect of the manner of death, and relating to a female, aged thirty-six, in whom the disease had run its course rapidly, and terminated fatally in the space of five months) a considerable portion of the lungs continued still permeable to the air,—the alterations in the stomach and intestines were inconsiderable, the brain was healthy, the emaciation of the body, generally, greater than in the cases which have just been considered. It is remarkable, in truth, that in the latter, marasmus had only reached its second stage.

There are two other circumstances common to the greater number of cases of the class under consideration, and which are not noticed in those of phthisical subjects who die after prolonged

death-struggle (longue agonie); I allude to the ecchymoses, and the small quantity of the effusion observed in the lateral ventricles. Both these conditions are also met with in cases of sudden death, occurring during convalescence from illness, or under other circumstances, where no remarkable visceral disease exists.

I shall close the remarks it is my intention to make upon the subject of sudden death, by relating two cases, in both of which the *entire* encephalon had undergone very marked softening.

Case XLVIII. A dealer in old clothes, aged 54, of sanguineo-lymphatic temperament, subject to shortness of breath from infancy, had coughed and spit for two years, when admitted into the Hospital of La Charité on the 9th April, 1823. The patient's habitual shortness of breath became much more troublesome from the outset, and he suffered then from pain between the shoulders, which had since continued with more or less severity. Pain had also set in at the epigastrium, and under the false ribs; jaundice occurred eight or nine times during the first eleven months, since which it had not reappeared, and the epigastric pain had only been felt from time to time; the appetite failed when the latter was present. He stated, also, that before the invasion of the cough and expectoration, he had been for thirty years subject to sudden congestion of the brain (ictus sanguinis), indicated by sudden weakness in the limbs, flushing in the face, and vertigo, all of which disappeared quickly on each occasion. He had never lost consciousness. The fits, which at first occurred only at distant intervals, subsequently returned with greater frequency, every two or three weeks, for example, and were followed, during the six months preceding the invasion of the tuberculous disease, by weakness and numbness in one or other side of the body; this state lasted for an hour, or half an hour, after which his powers of motion recovered their natural freedom.

April 10th. *Present state.* Face emaciated and pale; no headache or pains in the limbs; speech rather short; respiration not hurried; cough not troublesome; sputa flat, green and opaque; on the left side anteriorly the chest emits no sound under percussion; there was scarcely any respiratory murmur, but dry rhonchus, or large crepitation without pectoriloquy; on the right side the respiration appeared to be natural; pulse

88, small and weak; there had been no rigors the day before, although a fit, followed by heat of skin and sweating, had regularly occurred every day at ten o'clock in the morning for the previous three weeks; tongue moist and not red; mouth somewhat clammy; the appetite almost completely gone; no thirst; abdomen free from pain; there had been no diarrhœa.

Rice ptisan with syrup of gum; blister to the left side of the chest; three portions of rice; broth twice.

The following days no obvious change occurred in the state of the circulation and respiration; the patient became hot in the evenings, without having been previously cold, or sweating afterwards; a few liquid stools were passed.

19th. In the course of the day he felt general uneasiness, without being able to assign any cause for it; the following night slight disturbance of the intellectual faculties occurred.

20th. In the morning there was considerable stupor, the intellectual faculties were almost abolished, the pupils very much contracted; the speech very much embarrassed; powers of motion retained fully on both sides of the body; tongue moist, does not deviate to the right or left when put out; pulse 130; respiration very slow. The same symptoms continued until 10 p.m., when the patient expired.

Sectio Cadaveris; *thirty-four hours after death.*

External appearances. Nothing remarkable.

Head. Granulations, originating in that part of the dura mater where the separation of its laminæ takes place, protrude through numerous slits in the membrane. Sub-arachnoid tissue very slightly infiltrated; brain pale, moist, and very soft throughout its *entire* extent, resembling in consistence that of an infant aged from six to eight months; a tablespoonful and a half of limpid serosity in each lateral ventricle, and much less in the inferior occipital fossæ. Pons Varolii and cerebellum almost as soft as the brain.

Neck. Larynx natural; mucous membrane of the membranous portion of the trachea of a bright red colour.

Chest. Close adhesions at the apex of the right lung; forming a semi-cartilaginous cap, from one to two lines [2 to 4 millimeters] thick. There was a very large cavity in this situation, surrounded with tubercles and gray semi-transparent matter; the rest of the upper lobe almost completely transformed into

substance of the latter description. Between the principal masses of gray substance appeared a homogeneous, rather firm matter, resembling in some measure, in respect of colour and semi-transparence, calves-foot jelly of light colour, and exhibiting a granular aspect from place to place. The lower lobe only presented a small number of tubercles, and slight engorgement. There were some adhesions at the apex of the left lung, the upper lobe of which, more or less indurated, was free from excavation, and in other respects resembled the corresponding lobe of the left lung.—Bronchi red and thick on the latter side; thin and of slightly pink colour on the right.

Abdomen. In removing the anterior wall of the abdomen I tore part of the fundus of the gall-bladder, which adhered very closely to it. The gall-bladder, protruded two inches [5 centimeters] beyond the edge of the ribs, and contained two hundred calculi, the largest of which were of the size of a pea, the smallest of a millet-seed. The mucous membrane of the sac was destroyed to a superficial extent of about three inches and eight lines [9 centimeters] in the situation of the external adhesions, and to a somewhat less extent near the neck. These ulcerations looked as if made with a punch. Around them and elsewhere the mucous membrane was firm, and about a quarter of a line [$\frac{1}{2}$ millimeter] thick, and appeared to consist of fibres interlaced in a multitude of directions, so as to exhibit very much the aspect, except in respect of size, of a columnar bladder: the submucous cellular tissue was thickened, and that forming the fundus of the ulcerations very fragile. The cystic duct was very narrow near its junction with the hepatic, and contained several calculi; the ductus communis choledochus was perfectly healthy.—Liver, spleen, pancreas, and kidneys perfectly healthy.—Some tuberculous granulations in the suprarenal capsules.—Mucous membrane of the stomach of gray colour, shaded with pink, mammillated over the greater part of its surface, somewhat thicker in the mammillated part than elsewhere, partially destroyed within a surface of limited extent near the pylorus.—Some of the elliptical patches of Peyer ulcerated.—Mucous membrane of the colon thickened and softened; presents a great number of small ulcerations, which diminish in number from the cæcum to the rectum.—Mesenteric glands healthy.

Here, as in the two preceding cases, the cause of the almost sudden death is unassignable. I shall not endeavour, in truth, to show it to have been dependent on the softening of the encephalon, for I am not aware at what stage of softness the brain ceases to be capable of sustaining life; but I must observe, that alterations of consistence are changes of the most serious character, and deserving of the very greatest attention. The labours of MM. Rostan and Lallemand have thrown great light on *partial* softening of the brain; but it remains to be ascertained under what circumstances a certain amount of *general* softening (which may always be recognized with ease by persons accustomed to researches in morbid anatomy) should be considered morbid. And, in great measure, with the view of lending some assistance in solving this problem, I shall further on relate another case of the kind, in which the coexisting tuberculous disease ran a latent course.

The state of the brain was not the only remarkable circumstance in the case before us. The mammillation and thickening of the greater part of the mucous membrane of the stomach, and its attenuated state near the pylorus, are also worthy of attention. And they become more particularly so, when considered in connexion with the gastric symptoms experienced by the patient during the two years before his death,—namely, pain of variable intensity at the epigastrium, and failure of appetite. These symptoms are in truth those of chronic gastritis, and may have been the effect of that which produced the mammillated condition in question;—still the coexisting complications must of necessity leave some doubt as to the accuracy of this view. The connexion between the calculi in the gall-bladder, and the thickening and ulceration of its walls on the one hand, and the pain experienced at the border of the false ribs, with the jaundice recurring frequently in the course of one and the same year, on the other, is also worthy of remark.

Case XLIX. A cook, aged 48, of middle height, moderately stout, and of very acute sensibility, had always enjoyed good health, until seized with the illness to be presently described. She had ceased to menstruate at the age of thirty; the discharge appeared first at the age of eighteen, and had never appeared more frequently than every six weeks, was small in

quantity, and lasted for a few hours only. Three years before her admission she suddenly lost all faculty of motion and sensation, in a fit of deep grief caused by the loss of her savings; the intellectual faculties were not affected. Having made up her mind to die, she abandoned her illness to itself, and remained in very much the same situation for two months. After that period she continued for a considerable time to suffer from pains in the limbs, and soon after, the feet and hands gave signs of recovering their power of motion. The improvement, however, was but slow, to such a degree that the patient was not able to resume her occupations till the eighth month of her illness. She continued in tolerably good health for six months, when she was seized (without assignable cause) with erysipelas in the left leg. A quack, whom she consulted, alarmed her as to the probable issue of this affection; and immediately upon this, all discharge of mucosity from the nose ceased, as did likewise leucorrhœa, which had existed from infancy, and spitting of blood, suffered from for the same length of time, returned morning and evening, and was ascribed by the patient to the bad state of her gums. She had been very subject to epistaxis, but this ceased altogether; she felt a sensation of weight on the frontal sinuses, lost the faculties of smell and taste, but retained her appetite: the suppressed discharges did not return, nor did the patient recover her lost gaiety.

Three weeks before her admission she had been seized with headache, so violent as to make her keep her bed for five days successively, and accompanied with heat and thirst, without any other symptoms. She was not subject to colds, and did not cough.

February 16th, 1822, (the day following her admission.) Intellectual faculties perfectly sound; slight headache, taste and smell completely lost; nose very much widened at the base and laterally,—the enlargement being ascribed by the patient to her habit of picking her nose, since she had ceased to have any occasion to blow it. Strength slightly diminished; tongue natural; thirst rather urgent; appetite slight; bowels natural; pulse quiet; skin moderately hot; respiration free; person tolerably full.

Infusion of dulcamara; sulphur-baths; blister to the arm; one eighth of house-allowance.

The headache ceased altogether, but reappeared, though of slight amount, on the 20th of the same month, after exposure to cold air. On the 22d it had decreased considerably, the appetite had improved, and there was only a natural degree of thirst. 23d. Nothing remarkable. 24th. The patient complained, at 10 o'clock, p.m., of heat, general uneasiness, and a feeling of swelling in the face; at midnight she had ceased to live.

Sectio Cadaveris; *thirty-two hours after death.*

External appearances. A few ecchymoses on the surface; very strongly-marked cadaveric rigidity.

Head. Brain pale, free from the very slightest trace of injection, extremely soft, and like that of a new-born infant throughout its *entire* mass; olfactory nerves natural. Mucous membrane of the nares healthy; that of the frontal and maxillary sinuses a line and a half [3 millimeters] thick, looks as if infiltrated, semi-transparent, firm, and of the colour of apple-jelly. There was no dry mucus in these parts.

Neck. Glottis, epiglottis, and larynx natural.

Chest. A few cellular adhesions at the upper part of the left lung; five unsoftened tubercles of the size of a hazel-nut at its apex, surrounded with a little gray semi-transparent matter; four nodules of bony and earthy matter in their interstices. Slight engorgement of the posterior edge of both lungs. Bronchi pale and thin.

Abdomen. Convex surface of the liver uneven, and more or less deeply furrowed in various directions, something like the convolutions of the brain: the tissue healthy, and slightly engorged with blood, especially in the right lobe.—Mucous membrane of the stomach of slaty-gray colour, shaded with pink in some places.—That of the small intestine in the natural state.—Kidneys contain much blood.—Spleen firm, large, and rather pale-coloured.—The rest perfectly healthy.

Without feeling disposed to assign the cause of the sudden death of this patient, I may observe that her case presents great analogy, in respect of the state of the brain, to that last related, and no less strong similarity in the cerebral symptoms. The two patients were of about the same age, forty-eight and fifty-four years of age. The brain, which at that period of life is extremely firm, was in them (although they died suddenly), especially in

the subject of the last case, extremely soft, like that of a newborn infant, or very nearly so. Such a remarkable diminution of consistence as this appears to me to constitute an unquestionably morbid state; and the symptoms occurring at a certain period of life corroborate this opinion, inasmuch as their cause can have been none other than a particular condition of the brain. In one case these symptoms consisted of dazzling before the eyes, and sudden weakness of the limbs, which lasted but a short time, and frequently recurred during the space of thirty years;—these symptoms occurred with greater frequency during the last six months of life, and numbness of the limbs, lasting half an hour, supervened,—after this, the faculty of motion recovered its previous activity: the intellectual faculties remained unaffected throughout. In the other case, total paralysis of sensation and movement occurred three years before death; this condition lasted two months, did not disappear completely till the eighth, and, as in the preceding case, the intellectual faculties remained unaffected: in both individuals the cerebral symptoms ceased two years before death. If the resemblance between the symptoms in the two cases be not perfect, there is at least strong analogy between them; and, in the instance where the cerebral symptoms were most severe, the softening of the brain was carried to the greater extent. All these circumstances render it almost impossible to avoid recognizing a state of mutual dependence between the morbid state of the brain and the symptoms observed.—If this comparison between the cases do not produce conviction on the point, it may at least draw the attention of observers to the matter, and this, as I have already said, is the principal object I had in view.

I shall not dwell upon the sudden disappearance of the nasal, buccal, and other excretions; but it is worthy of being observed, that there were tubercles in the left lung, that they had been latent, and not excited cough,—that the patient was not subject to pulmonary catarrh; that the bronchi, as the reader may have noticed frequently in similar cases, were perfectly healthy, and that consequently, in this case at least, the tubercles could not be looked upon as the result of chronic inflammation of those tubes.

As in the majority of cases of sudden death which I have related, there were vibices in the limbs.

I shall now proceed to the study of those cases in which the disease ran a more or less insidious and latent course, as it does more commonly than might, on first consideration, be supposed.

SECTION III.—LATENT PHTHISIS.

Case L. A woman, aged 32, endowed with much intelligence and memory, of middle height, and of rather strong constitution, was admitted into the Hospital of La Charité on the 9th November, 1822. She was not subject to cold, stated that she had been three years ill, and much worse for the last two months and a half. Rigors, followed by heat and perspiration, occurred at the outset, and from that period up to the last three months, returned every day at about one o'clock in the afternoon; the appetite failed at the commencement, and had not returned subsequently; she suffered from considerable thirst, and was losing flesh. *No other symptoms occurred in the course of the first year. At the beginning of the second,* cough set in, accompanied with expectoration of clear sputa, which had, within the last three months, become more or less thick and nummulated. The patient had kept her bed for nine weeks, and suffered from slight diarrhœa for a month, when she fell under my observation for the first time.

November 10th. *Present state.* Organs of sense and intelligence unaffected; last stage of marasmus; respiration moderately hurried; cough not troublesome; sputa nummulated, dirty coloured, of slightly pink tint, the majority of them diffluent; the chest emitted no sound under the clavicles, especially the left, to a considerable distance downwards: in these parts the respiration was tracheal, and pectoriloquy evident; the same phenomena existed posteriorly in the corresponding regions; the pulse was small, weak, regular, and frequent; the body of natural temperature in the day-time, very hot at night; perspiration limited to the head and chest; tongue natural; mouth clammy; thirst not troublesome; complete anorexia; deglutition difficult; sensation of heat and dryness in the throat, as for the last two months; abdomen somewhat tender under pressure. Three stools the previous day, consisting almost wholly of mucus. Considerable weakness.

Rice ptisan with syrup of quinces; three cups of decoction of caschu with syrup of quinces; gum potion; two rice-creams.

No appreciable change took place the following days, and on the 18th of the same month the patient expired after a few hours' struggle.

Sectio Cadaveris; *forty-eight hours after death.*

External appearances. Nothing remarkable.

Head. Arachnoid thick, somewhat opaque near the longitudinal sinus over a surface two inches and four lines [6 centimeters] broad, adhering in some parts of its surface to the dura mater; partial and very slight sub-arachnoid infiltration; two small tablespoonfuls of serosity (turbid on the right side) in each of the lateral ventricles.

Epiglottis, larynx, and trachea not examined.

Chest. Strong cellular adhesions at the apex of the right lung; the left perfectly free from adhesion. Upper lobe of both extremely friable, containing a multitude of small excavations, communicating with each other, and lined with pseudo-membrane; in the spaces between them semi-transparent granulations existed in considerable number, with a little hepatized tissue. The lower lobes were healthy. Heart of proper size; walls of the left ventricle attenuated, those of the right manifestly thickened; both of rather considerable consistence.—Aorta shaded with pink in several places; otherwise perfectly healthy.

Abdomen. Size of stomach natural; mucous membrane pale, without the least lividity, of proper thickness and consistence.—Duodenum healthy.—Tuberculous granulations in the lower half of the small intestine; several of them slightly ulcerated; on others, which were not softened, the mucous membrane was perfectly healthy.—Mucous coat of the large intestine somewhat softened near the cæcum, where it presented small ulcerations, from one to two lines [2 to 4 millimeters] in diameter, without tubercles. Nothing remarkable in any other part of its extent.—Mesentery and abdominal viscera natural.

The course of the disease in this case presented two distinct periods. One of these was marked by fever without cough; in the other, the febrile action was accompanied with cough and expectoration. Did phthisis exist during the first of these

periods, or set in only with the second? If the post-mortem examination had disclosed any serious and old-standing morbid change in any other organ than the lungs, to it the symptoms of the first period might have been ascribed. But such was not the case; no morbid change of the kind was detected except in the lungs, so that to these organs we must attribute the fever unattended with cough of the first period, as well as the fever with cough of the second,—and the more so, as its characters were the same in both. And as the fever was not preceded by pulmonary catarrh, the case before us justifies the conclusion that tubercles may be developed in the lungs, independently of pulmonary catarrh, and once developed, exist for a long time in a latent state, that is, without exciting cough or expectoration.

There is another circumstance which gives much interest to this case,—I mean the fact of the existence of considerable and increasing failure of appetite for a period of three years, although the mucous membrane of the stomach presented no kind of morbid change. Assuredly this is among the number of facts most clearly demonstrating what I have already had frequent occasion to state, namely, that a function may be disturbed for a considerable time, without any appreciable alteration of structure being discoverable. It shows, too, that loss of appetite is not sufficient to denote gastritis, and that febrile action—frequency of pulse, increased heat of skin, &c.—may, whatever be its cause, similarly affect the appetite.

Lastly, this case furnishes an example of a very rare condition, namely, the presence of tubercles exclusively in the two upper lobes of the lungs.

Case LI. A bellows-mender, aged 44 years, born of parents who died at an advanced age, of moderately strong constitution, with fair skin and black hair, and, generally speaking, enjoying perfect health, was brought to the Hospital of La Charité on the 24th of March, 1824. He was a small eater, committed no kind of excess, and stated that he had been nine months ill. At the outset, rigors, followed by heat and perspiration, thirst, loss of appetite, &c. supervened; the fever was severe enough, during the first two weeks, to oblige the patient to keep his bed, after which it diminished in severity, without disappearing

altogether,—the heat of body always continued greater than natural, and rigors occasionally occurred; the thirst became somewhat less urgent; the appetite improved, without reaching its former amount; the patient was enabled to resume his work, and remained in this doubtful condition of health for about four months, meanwhile remaining free from cough. During the succeeding months the fever continued, rigors recurred daily, the strength failed; the patient ceased to work, and remained a part of each day in bed. For *the last six weeks* there had been complete anorexia, and *slight cough soon supervened;* at the time of the patient's admission cough had existed but for one month only. Questioned repeatedly upon this point, the patient persisted in affirming that he had not coughed before that period. He stated that he had suffered four months from difficulty of breathing and hoarseness, had lost flesh considerably within that space of time, had occasional pains between the shoulder-blades, and within the last three years three attacks of very copious hemoptysis, the last of them a few days only before his admission.

March 25th. *Present state.* Face natural; insomnia, caused by cough; sputa yellow, greenish, not nummulated, in the midst of a considerable quantity of clear fluid; chest sonorous; crepitant rhonchus audible nearly all over the chest, stronger at the apex than the base of the lungs; tracheal respiration and manifest pectoriloquy between the shoulders; on the right side a sort of metallic tinkling accompanies the voice; pulse regular, very slightly hurried, but weak; tongue moist and clean, pale at the edges; marked with red points in the centre; mouth clammy; thirst inconsiderable; almost complete loss of appetite; breath fetid; bowels not open for the last two days; the whole abdomen yielding and free from pain.

April 1st. The general state of the patient little changed; he complains of constipation and extreme feebleness; the metallic tinkling more marked than before; anteriorly, on the right side, crepitant rhonchus, mixed with gurgling; percussion dull under the left clavicle; slight sensation of oppression at the epigastrium.

2d. General uneasiness and distress; oppression increased. These symptoms became more and more marked; and on the following day, at 5 a.m. the patient expired.

Sectio Cadaveris; *twenty-seven hours after death.*

External appearances. Nothing remarkable.

Head. Rather abundant sub-arachnoid serous infiltration; glands of Pacchioni adherent to the dura mater, near the median fissure; pia mater slightly injected; brain firm and healthy; two tablespoonfuls of serosity in the lateral ventricles.

Neck. Epiglottis, larynx, and trachea natural.

Chest. Lungs adherent, over their entire surface, to the costal pleura; at the upper part the adhesion was effected by means of very dense pseudo-membrane, one line [2 millimeters] thick; and lower down by cellular filaments. The left lung presented, at its upper part, a very large anfractuous cavity, crossed by bands and invested by pseudo-membrane of semi-cartilaginous structure, lying upon pulmonary tissue, more or less deeply diseased. Two thirds of the upper lobe (measuring from the acute border) were indurated and grayish coloured, and presented on section a granular aspect, being actually hepatized, of slight consistence, friable, and containing, besides, tubercles and gray semi-transparent granulations in abundance. At the upper part of the right lung appeared a cavity similar to that in the left, but still larger, and the remainder of the upper lobe contained numerous tubercles and gray granulations.—The bronchi communicating with these large cavities were very red and much thickened; the others thin and of delicate pink colour.—Heart and aorta natural.

Abdomen. Stomach of moderate size, containing a tolerably large quantity of thick viscid mucus; the mucous coat somewhat red round the cardiac orifice, grayish coloured along the great curvature, white elsewhere; slightly softened in the fundus, natural in respect of consistence and thickness everywhere else. —Mucous membrane of the small intestine, more or less red in some places, presents five ulcerations of inconsiderable dimensions in the lower half, many of them exhibiting tuberculous granulations in the centre.—Three large ulcerations in the cæcum; mucous membrane of the colon pink coloured in some places, otherwise perfectly healthy; fæces of a fine yellow colour, of ordinary firmness.—Mesenteric glands rather large, unchanged in respect of colour and consistence.—Liver somewhat pale; bile in the gall-bladder thick, like treacle.—Other abdominal viscera natural.

Between this and the preceding case it is obvious an extremely strong analogy exists, in respect of the uncomplicated character of the affection, and the course of the symptoms. Fever set in before the cough; the latter indeed only existed during the closing six weeks, and on post-mortem examination no morbid change of serious character or long standing was discovered, except in the lungs. It is impossible consequently to ascribe the fever, which preceded the cough, to the influence of any anatomical change, except those existing in the lungs; and we are obliged to conclude that the tubercles were developed long before the invasion of cough, and independently of bronchial catarrh.

This conclusion must appear even more natural and obvious in the present than in the preceding case. For in the present instance there had been cough for only six weeks, while on the other hand the tuberculous cavities were very large; and we have seen, more especially in connexion with the subject of acute phthisis, that such cavities do not form in six weeks or two months, and that their existence involves a duration of at least four or five months of the primary disease.

In both cases, then, pulmonary tubercles existed for a more or less considerable period without exciting cough. But while in this latent state, they gave rise to febrile symptoms more or less intense, and to loss of appetite, of flesh, and of strength. In cases of this kind is it possible to determine the true source of the evil?

In the case just related, this was by no means impossible; for two years before the invasion of the febrile symptoms, the subject had had more than one attack of hemoptysis,—and as we have already seen, hemoptysis indicates, if not with certainty, at least with an infinite amount of probability, the existence of tubercles in the lungs. On the supposition that this patient had been seen during the earliest weeks of the fever, the previous circumstances should have led the observer to suspect the presence of pulmonary tubercles, and even at that time auscultation would perhaps have removed all doubt on the matter. Here, I may observe, is a new motive for never neglecting to use this mode of investigation, whenever febrile symptoms, of which the cause is unknown, exist, more especially if they have been preceded by one or more attacks of hemoptysis.

Among the secondary phenomena deserving of some atten-

tion, the metallic tinkling may be noticed. This phenomenon depended here, in conformity with the statements of Laennec, upon the existence of a vast cavity filled with air and fluid, as proved by the post-mortem examination. The almost perfectly healthy state of the mucous membrane of the stomach, although the digestive functions had long been deranged, also deserves to be particularly considered. However, no serious textural change of this membrane was to be anticipated, inasmuch as there had been neither nausea nor vomiting. Lastly, the bronchi were healthy, with the exception of those communicating with the tuberculous cavities,—a circumstance denoting, as has already been remarked, that thickening of their substance and alteration of their mucous membrane, are ordinarily the results of the transit of the contents of cavities through them.

Case LII. A mantua-maker, aged 22, born of healthy parents, not subject to take cold, generally enjoying good health, and extremely fat, was admitted into the Hospital of La Charité on the 9th of September, 1824. She had been short-breathed from infancy, and stated herself to have been ill for two years and a half. During the first seven months there had been continued fever, with hot and cold paroxysms, occurring daily at 4 p.m.; these paroxysms gradually diminished, and eventually ceased altogether, without the least treatment having been employed. While they lasted, the patient kept her bed altogether, eat but little (she had lost her appetite, almost wholly from the outset), and lost flesh very considerably.

After this she recovered a little flesh and strength; the dyspnœa increased greatly, and was extremely severe *during the three months which preceded her admission into hospital, that is, from the time that cough and expectoration commenced.* Up to that time there had been neither cough nor expectoration, a fact respecting which, as well as the other points in her history, the patient, who was endowed with excellent understanding and memory, did not swerve in the least degree in her statements. The appetite was invariably extremely slight; there was constant diarrhœa, which sometimes became considerable during the last eight months, and was accompanied with more or less severe colic-pains. The patient's feebleness increased daily; she had kept her bed for five months, when she first fell under my ob-

servation. Rigors, followed by heat and sweating, had reappeared within the last five weeks. There had been no hemoptysis.

September 10th. *Present state.* Face pale; extreme debility; intellectual faculties in a state of perfect integrity; marasmus in its last stage; very marked oppression of breathing; speech short; cough severe in the morning, slight the remainder of the day, sputa greenish, small in quantity, semi-opaque; tracheal respiration and perfect pectoriloquy under the left clavicle, here the chest emitted no sound over a surface measuring six inches [15 centimeters] from above downwards; the same was the case posteriorly; on the right side the respiration appeared natural; pulse weak and frequent; skin rather hot; tongue pale; appetite very small; liver protrudes three inches and seven lines [9 centimeters] beyond the false ribs; epigastrium free from pain; three stools, preceded by colic-pains, within the last twenty-four hours.

White decoction; solution of syrup of gum; julep; rice; one egg.

12th. The patient complained, for the first time, of pain at the upper part of the larynx.—18th. The laryngeal pain very much as before; only felt when she swallows; appetite somewhat improved; cough rare; no rigors.—20th. Cough increased; sensation of suffocation; bowels much relaxed; copious perspiration.

Gum potion, with three quarters of a grain [5 *centigrammes*] *of opium.*

The diarrhœa decreased rapidly, the cough continued alternately severe and slight; nausea, or even vomiting of clear fluid mixed with mucus, occasionally occurred; appetite completely gone; voice unchanged.

30th. Pain in the neck gone; cephalalgia and sensation of lassitude in the limbs; tongue, lips, and inner surface of the cheeks covered with a great number of thin white patches, underneath which the mucous membrane was somewhat redder than natural; no pricking pain in the tongue; on the following day the patches had disappeared. Great difficulty in swallowing supervened; expectoration ceased; the pulse lost some little of its frequency, beating only 90 in the minute, the last two days of life. The patient expired on the 4th of October, at 10 a.m.,

having retained her consciousness to the last hour, the approach of which she regarded with horror.

Sectio Cadaveris; *Twenty-two hours after death.*

External appearances. Nothing remarkable.

Head. Four small spoonfuls of serosity in the upper part of the arachnoid; slight sub-arachnoid infiltration; pia mater moderately injected; cortical substance of pink colour; the medullary substance exhibits dots of blood to a small amount. A tablespoonful of clear serosity in each lateral ventricle; two in the inferior occipital fossæ.

Neck. Mucous membrane of the pharynx, pale and thickened, presents a great number of small ulcerations, varying in diameter from one to two lines [2 to 4 millimeters.] Lower half of the mucous membrane of the epiglottis destroyed; larynx and trachea not remarkable in any way.

Chest. Left lung closely adherent to the costal pleura; upper lobe invested with pseudo-membrane, of semi-cartilaginous appearance, from one line to one and a half [2 to 3 millimeters] thick, united at the acute border with another much less thick, which partially invested the upper lobe on the right side. The left lung contained at the apex a vast cavity extending nearly to the anterior border, with very thin walls posteriorly, bounded inferiorly by an anfractuous septum, of slight thickness, separating it from another cavity seated close to the posterior border of the lower lobe. The remainder of the upper lobe was transformed into grayish, opaque, non-granular matter, traversed by a great number of white firm septa, which appeared on first sight to be continuous with the sort of semi-cartilaginous cap described; in the middle lobe a tolerably considerable number of small tuberculous cavities. The cavity in the lower lobe was of medium size, contained thick fluid of bright red colour, and was traversed like that in the upper, by a great number of bands formed of gray semi-transparent matter. Elsewhere this lobe contained masses of some size, composed of gray semi-transparent matter, in the midst of which lay a great number of whitish and yellowish granulations. The intermediate tissue healthy. At the apex of the right lung appeared some small excavations, and throughout its entire substance granulations in abundance, or masses of gray semi-transparent matter like those in the left. Several of these measured one inch and two

lines [3 centimeters] in breadth, by three inches and eight lines [9 centimeters] in length, and were studded with white, opaque, miliary spots; two fifths of the organ were still permeable to the air. Bronchi somewhat red, slightly thickened near the cavities, healthy elsewhere.

The pulmonary artery (which had been filled with injection) sends a great number of ramifications into the healthy parts, very few (and even these only into some of them) into the gray semi-transparent matter. I found none in the gray opaque matter in the upper lobe of the left lung,—a matter which was, to all appearance, the product of chronic inflammation of the pulmonary parenchyma. Numerous bands in the tuberculous cavities received arterial ramifications measuring half a line [1 millimeter] or rather less in diameter.—The heart was small; its walls somewhat thin but of good consistence. Aorta healthy and narrow.

Abdomen. Stomach elongated, and almost completely overlapped by the liver; mucous membrane of rather bright red colour, somewhat less firm than usual at the anterior surface; perfectly healthy elsewhere.—Some small ulcerations in the lowest sixth of the small intestine, and between them numerous white, opaque, semi-cartilaginous-like granulations, which increased in number and size towards the cæcum. Elsewhere the mucous membrane presented the characters of health, with the exception of some red spots. The cæcum, ascending and transverse colon contained eight irregular-shaped ulcerations, varying in superficial extent from three inches and seven lines to five inches and two lines [9 to 13 centimeters]. The mucous membrane was destroyed in these places, and the sub-mucous tissue uneven and thickened. In the interspaces between these ulcerations and elsewhere, the mucous coat was somewhat softened, double its natural thickness, and violet coloured in some places.—Mesenteric glands small and healthy.—The liver, protruding three fingers' breadth beyond the ribs, was of slightly buff colour, spotted with red points, and in several places presented a much paler tinge than through the general mass. It was not obviously fatty. The bile contained in the gall-bladder was of blackish colour, and almost of the consistence of treacle.—The spleen was of small size and softened.—The remaining viscera natural.

The remarks appended to the previous cases are naturally

applicable to the present one. When the patient fell under my observation she had coughed for two months only, and yet, at that period, excavations of large size (evidently produced long previous to the supervention of cough) existed in the left lung. The formation of tubercles had consequently preceded the cough, and cannot be considered an effect of pulmonary catarrh. The state of the mucous membrane of the stomach denoted a recent alteration, the intestinal ulcerations, which were a dependence on the pulmonary tuberculization, had originated subsequently to this: and hence it is to the lungs, the only organs long and seriously diseased, that we must of necessity ascribe the intense febrile phenomena experienced by the patient during the first six months of her protracted illness. It will not be objected by any one that the fever in question was an intermittent one, for fever of that description neither destroys the appetite, nor deprives patients of strength to such a degree as to oblige them to keep their bed.

The view I have espoused on this question may appear to some rashly adopted; but if it be borne in mind that the patient, endowed as she was, with excellent understanding and memory, was most closely interrogated during life, and the organs scrupulously examined after death, it must, I think, be admitted that the facts being well established, the conclusions I have drawn are no more than those rigorously deducible from the premises. From cases of doubtful character we assuredly ought not to draw any conclusions; but, on the other hand, we should have no hesitation in drawing them from well-ascertained cases, more especially when these are simple, and not rendered difficult of interpretation by complications.

The redness combined with slight softening of the mucous membrane in the anterior surface of the stomach was, as I have already said, an alteration of recent formation. The slight pains in the epigastric region, and the nausea occurring after the patient's admission into hospital, and not till then, support this manner of viewing the subject. And from this it follows that, in the present case, as in the first two related in this section, the loss of appetite, existing long before the patient's death, depended, not on an appreciable change in the mucous membrane of the stomach, but, beyond all doubt, upon the general condition of the patient,—perhaps upon the fever, the influence of which extended to the stomach as to the other organs.

With respect to the mode of distribution of the pulmonary artery, I shall simply refer the reader to what has been said in the First Part (p. 29) of this work. It is worthy of note, that the left lung was almost wholly converted into cavities, or into gray matter, of opaline or semi-transparent aspect; and that scarcely two fifths of the parenchyma of the right lung remained permeable to the air, and capable of sustaining the functions for which both organs were originally destined.

The following case is another example of latent phthisis; here the course of the disease was so obscure and slow, that it was not recognized during life.

Case LIII. A woman, aged 31, of delicate constitution and very acute sensibility, and short-breathed from infancy, complained of having suffered frequently from indisposition for several years. She affirmed that she was not subject to take cold; but, on tracing back to the earliest derangement of her health, I ascertained that she spit a little every morning for the last seven years, and had had continual cough for the first eighteen months of that period. The cough had been scarcely at all troublesome, and had ceased spontaneously during a long journey, and a sojourn of three months at the sea-side, though the patient had not altered her usual habits of living in the very slightest degree. She did not remember to have had any cold since; but fogs and strong smells brought on cough temporarily. The habitual dyspnœa had been somewhat worse than usual during the last three years. At the beginning of that period, digestion became laborious; from time to time weight and pricking pains were felt in the right hypochondrium, and the skin acquired a slightly yellowish tinge. These symptoms led to the belief that the patient laboured under organic disease of the liver; for four or five months she took calomel, and frequent doses of purgative medicine, and observed strict abstinence, although the appetite was almost in the same state as in health. This treatment was not productive of the slightest improvement. Subsequently, digestion became still more laborious, the appetite failed, and the catamenia, which had been suspended on different occasions, three or four months at a time, had been absent for seven months when the patient was admitted into the Hospital of La Charité, the 2d of January, 1823. She had

been subject to sore throat and palpitation of the heart; there had been urgent thirst, from time to time, previous to the last three years. She had never had hemoptysis.

January 2d. *Present state.* Colour of the skin, all over the body, somewhat yellowish; conjunctivæ of natural colour; face spotted, from place to place, with slight bistre tint; rather marked feeling of weakness; lassitude in the limbs; prickling sensation in the legs, the back, and the sides of the chest; speech rather short; no oppression of breathing while she remains still, she gets out of breath when she takes any exercise; neither *cough* nor expectoration; chest sonorous over its entire surface; respiratory murmur in nowise remarkable, except under the right scapula, where it appeared harsher than on the left side in the corresponding spot; pulse a little frequent; gentle heat of skin; appetite poor; no thirst; digestion, especially of animal food, easily accomplished; tension and resistance over a flat surface in the epigastric region; hypochondria yielding; bowels rather confined; urine abundant, and passed with ease. The patient complained only of weakness, and of slight pain at the nucha.

Ptisan of saponaria officinalis: a drachm [4 *grammes*] *of extract of gentian twice daily: quarter of house-allowance.*

She remained nine months in the hospital, and died there on the 28th of September. During this period I examined her every ten days, much more frequently, however, the last month; the following are the results of my observations. There was some slight cough at the close of February: from that time to the month of September the patient frequently assured me that she did not cough: her respiration became very hurried on the least movement, but the absence of cough leading to the idea that the dyspnœa was the result of weakness merely, I paid little attention to it. During *the last fifteen days of September the cough was rather violent, and I myself heard it for the first time.* On the 22d some nummulated sputa were observed, and led me to suspect the existence of phthisis; but auscultation practised in an imperfect manner did not furnish any decisive result.

The pulse continued always small and weak; it was not much hurried during the first six months, but subsequently became more so every day. Some slight heat usually came on in the evening; and during the last month some attacks of rigors occurred, with perspiration at night over the chest and neck.

The appetite varied; during the first seven months the patient eat the quarter or half quarter of house-allowance. The process of digestion, almost always laborious, became somewhat less so part of the fourth and fifth months, during which the patient took boluses of ox-gall. Nausea occurred occasionally during the last forty days of life. At the beginning and during the progress of this last period, she complained of pain along the neck and obstruction in swallowing, especially when the ingesta were in the situation corresponding to the cardiac orifice. She always suffered from thirst in the evenings.

From the fifth month the liver was ascertained to protrude beyond the edges of the ribs, and the patient felt a weight falling to the right or left, according as she lay on one side or the other.

The tongue was constantly the seat of a sensation of heat and uncomfortable prodding pain; it retained its natural colour till the close of August. It then became covered with small white rounded patches, of greater or less thickness, which remained one or two days, and reappeared after an interval of about the same length. It retained its habitual colour for the first few days after the appearance of the patches, and then became red. Similar exudation took place on the palate, on the inner surface of the cheeks, and on the posterior surface of the lips.

There were frequent and sometimes very severe attacks of colic; with slight diarrhœa, from time to time, during the last six months.

The yellow tinge of the skin remained without change; and towards the middle of July the spots on the face were of much deeper colour than when I first observed the patient; her face appeared covered with a mask. The lower part of the legs was œdematous during the last six months; the patient's feebleness increased slowly, and she did not keep her bed till the last fortnight of life.

Sectio Cadaveris; *thirty-four hours after death.*

External appearances. Last stage of marasmus; slight serous infiltration of the lower part of the legs.

Head. A few glands of Pacchioni along the median fissure; brain somewhat yellowish on the surface, firm in its tissue; rest of the encephalon perfectly healthy.

Neck. Base of the tongue somewhat red, and covered with pultaceous pseudo-membrane; larynx and epiglottis natural; trachea filled with mucous matter, looking like whitish foam; mucous membrane natural.

Chest. Left lung free from adhesions; weak adhesions at the apex of the right, opposite a tuberculous cavity of considerable size, lined with a thin pseudo-membrane lying in almost all directions on healthy pulmonary tissue. Numerous small cavities communicating with this were surrounded with tissue either slightly infiltrated or indurated. The lower two thirds of this lung were engorged and of pale red colour. The engorgement was less advanced in the left lung, which presented several small cavities at the apex, containing broken-up tuberculous matter in small quantity. The branches communicating with the cavities were, on one side and the other, of very delicate pink colour, and very thin; the others were pale; the mucous membrane in all of them was of natural consistence and thickness.—There were nearly six ounces [180 grammes] of serosity in the left pleura.—The heart was of moderate size; the lining membrane of the left ventricle and of the aorta presented a bright red colour, a colour extending pretty deeply into the middle tunic of the artery, which presented no change in thickness or density.

Abdomen. Mucous membrane of the œsophagus pale, and lined throughout its entire extent with pultaceous membrane, which seemed only in juxta-position with it.—Stomach of small size: mucous membrane both in it and in the small intestine perfectly healthy throughout, in respect of thickness, colour, and consistence. That of the colon grayish-coloured, and as soft as mucus in its lower two thirds.—Mesenteric glands natural.—The liver, without being enlarged, protruded three fingers' breadth beyond the ribs, was of deep yellow gamboge colour, of medium consistence, and fatty. Bile in the gall-bladder reddish and thick.—Kidneys pale and rather large.—The other abdominal viscera perfectly healthy.

Here the latent course of the disease is a matter so obvious, that lengthened considerations on the subject would be completely superfluous. During the nine months she passed at the hospital, the patient had, as it were, no cough, except during the last fifteen

days of life; and assuredly no one will be disposed to question the fact of the tuberculous cavities having been developed much before that time. In truth, the only point presenting any difficulty is the determination of the period of origin of the disease. If the lungs had been the only organs found seriously diseased at the post-mortem examination, and if the other organs had been either healthy or the seat of some recent alteration only,—no doubt then the origin of the phthisis must have been referred to the period at which the health of the patient began to be impaired. But the liver was evidently diseased, and had probably long been so; it was long supposed to be the only organ affected, and it may perhaps still be contended that the majority of the general symptoms which occurred several years before death, should be ascribed to it. If, however, we consider that three years before the change in the colour of the skin, the patient already suffered from chronic pulmonary catarrh (of very trifling severity, it is true, but which continued for eighteen months) —that after its disappearance the cough returned from the slightest causes, such as strong smells, fogs, &c.—that the morbid state of the liver was one of those which appear proper to phthisis, in other words, a dependence on it, and consequently produced later than itself,—if, I say, we take all these facts into consideration, we shall be disposed to adopt the opinion that pulmonary tubercles existed at the period of the chronic pulmonary catarrh, and that the general uneasiness and all the symptoms experienced by the patient from that hour to her death, were produced by those productions. Besides, it would be impossible to understand the slight severity of the symptoms if the cause upon which they depended had not acted with slowness,—that is, if the development of the tubercles had not been extremely chronic in its progress.

I have spoken of the change in the colour of the skin as if it were due to the liver; but this question may be regarded as open to doubt, in consequence of the colour of the conjunctivæ, and because in no other case of fatty transformation of the liver did such alteration of the colour of the skin exist. It is to be noticed, however, that the patient had experienced prodding pain, and a sensation of weight in the right hypochondrium,—symptoms of which none of the other patients had, under similar circumstances, complained.

Pseudo-membrane, of the same description as that observed in the mouth and on the tongue, existed all along the œsophagus. For one month deglutition through the œsophagus was accomplished with more or less difficulty, and pain felt in the neck; and as the trachea was healthy, it is presumable that both symptoms were due to an inflammatory state of the mucous membrane of the œsophagus, determining the pultaceous exudation described. This view appears to me very probably well founded; although I have frequently met with the same kind of exudation, where the symptoms in question had not been noticed.

It is to be observed further, that in spite of the frequent variations, the failure, and eventually complete loss of appetite, for a far from inconsiderable time, the mucous membrane of the stomach was perfectly healthy.

The structure of the pulmonary excavations also deserves some attention; for the largest of them was lined with a pseudo-membrane, which lay on almost perfectly healthy pulmonary tissue: cases of this kind are rare, and it is only in such instances, when there is but a small number of tubercles in the lungs, that it is possible to conceive the cure of phthisis by the approximation of the walls of cavities. Lastly, with the exception of a pale pink colour in those parts of the bronchi near the cavities, these tubes were perfectly healthy; and furnished in themselves evidence sufficient for the rejection of the notion that chronic pulmonary catarrh was the cause of the tubercles.

Case LIV. A girl, aged 21, of delicate health, and very acute sensibility, had within the last two months given up the trade of haberdasher, to enter into a religious community. She was perfectly well formed, moderately stout, and stated that she was six weeks ill, when admitted into the Hospital of La Charité on the 24th of September, 1822. She ascribed her illness to coarse food. The catamenia, established at the age of fifteen years, had recurred every fifteen days, for the first three years; subsequently somewhat less frequently, but always irregularly and attended with severe pain, especially in the loins. From their first appearance she had had leucorrhœa, and pretty frequently pain in the epigastric region; the latter had been much more troublesome for the last six weeks, to such a degree that the patient could not bear to have anything resting on the abdo-

men; it was increased by eating coarse vegetables, such as haricot beans, was very acute at night, and yielded somewhat, for an hour or so only, to a cordial draught, which caused great heat at the stomach. Nausea had subsequently come on, and the appetite failed almost completely; she suffered from frequent attacks of colic, sometimes from slight diarrhœa, and within the last three weeks she had a daily attack of rigors, followed by heat and slight perspiration; *there had been no cough;* and dyspnœa, to which she had been subject from infancy, did not appear to have increased obviously.

September 25th. *Present state.* Face pale; flesh tolerably firm; person as full very nearly as before her illness; disturbed sleep; headache but rarely; rather marked feeling of weakness; respiration slightly obstructed; oppression of breathing referred to the epigastrium; neither cough nor expectoration; pulse scarcely more frequent than natural; heat of skin natural; tongue moist, slightly whitish; mouth clammy and tasting disagreeably; anorexia, but no thirst; pain below the ensiform cartilage and at the umbilicus, without local heat; abdomen slightly enlarged; bowels confined for some days.

Solution of oxymel with syrup; emollient enema; two rice-creams.

The oxymel appearing to excite slight nausea, weak infusion of endive was substituted for it; the patient complained of this also, and she was ordered to use weak tea with a little milk, for drink.

October 4th. Some pain in the throat; respiration very much obstructed, sometimes gasping, and varying much in its characters; imperfect pectoriloquy on the right side, posteriorly and superiorly, and sometimes opposite the angle of the scapula; the voice appeared jerking and the respiration natural; there was neither *cough* nor pain in the chest; some slight heat of skin; the pulse frequent in the evenings; the pain in the epigastrium as before.

9th. Slight cough; tracheal respiration with perfect pectoriloquy between the shoulders, more marked on the right than the left side. In reply to close questions upon the state of her respiration previously to her admission, the patient stated that she generally had a cold every winter which lasted a month or two, *and that she had not coughed a single time for the last year.*

From this day until that of death, namely the 17th of November, the state of the chest remained very closely the same as before; the sputa were small in quantity, sometimes light and mucous, sometimes completely opaque and ragged; the cough, generally speaking, severe at night. From time to time fits of dyspnœa occurred, more especially at night; and the pulse did not materially increase in frequency till the last three weeks of life. Heat of skin occurred in the evenings, but neither rigors nor sweating.

The patient took a few warm baths, which only alleviated the epigastric pain temporarily; the suffering in this region soon after her admission, became very severe, was commonly attended with local heat, and ceased two days before death. Vomiting of bile took place on the 20th of October, and continued to the last, recurring once or more daily,—then frequently gradually increasing. The patient could not bear the same drink three days in succession; she felt disgust at every kind of food and drink. The tongue eventually became dry; colic and diarrhœa came on. She was extremely restless and agitated the last night, but retained her consciousness to the end.

Sectio Cadaveris; *twenty-seven hours after death.*

External appearances. Second stage of marasmus; livid discoloration of the right cheek on which the head had rested.

Head. Slight sub-arachnoid serous infiltration; brain and appendages perfectly healthy.

Chest. A small quantity of clear serosity in the cavity of the pleura. Lungs unattached, soft, crepitant, healthy at the base, indurated at the apex, where I found a rather considerable number of encysted tubercles; the majority of them were still in the state of crudity, some of them softened, and the evacuation of others had already taken place. The cysts were easily separated from the pulmonary tissue, in the midst of which they were developed, and between and below them lay a great number of gray granulations, some of them already yellowish in the centre. The bronchi were thin and of deep red colour.—Heart small; aorta of crimson red colour.

Abdomen. Some reddish serosity in the flanks, and a tumbler-glassful of greenish yellow healthy-looking pus in the cavity of the pelvis.—The omentum and small intestine were united by rather close adhesions, as likewise some of the convolutions of

the latter to each other in the situation of ulcerations of the mucous coat. There were a great number of miliary granulations on the surface of the small intestines, almost all of them semi-transparent, some of them only a little opaque in the centre, and all of them developed on the attached surface of the peritoneum. A surface measuring two inches and four lines [6 centimeters] of the fundus of the mucous membrane of the stomach red coloured; perfectly healthy in the neighbourhood of the pylorus, and at the anterior surface; elsewhere as soft as mucus. A great number of ulcerations existed throughout the small intestine, lying transversely on the surface, and from two inches and four lines to four inches [6 to 10 centimeters] distant from each other; several of them formed a complete ring round the bowel. The mucous membrane between them had the characters of health; where they existed, it had entirely disappeared, and the sub-mucous cellular tissue become thin and grayish-coloured; in some places the muscular tunic lay bare in a state of thickening, and from place to place its fasciculi were separated from each other by tuberculous granulations.—The transverse and ascending colon presented two stelliform ulcerations, as large as a five-shilling piece and upwards, of the same structure as those in the small intestine; between them appeared one of smaller size, the fundus of which was formed of peritoneum. The mucous membrane was pale and very much softened in the transverse colon.—The mesenteric glands were more or less completely tuberculized, and the portion of each gland which had not undergone this transformation —of a more or less bright red colour.—The liver was of large size, pale and buff-coloured, studded with red points, easily torn, and fatty. The gall-bladder rather small, filled with blackish viscid bile, like treacle.—The other abdominal viscera healthy.

The single fact that pectoriloquy was detected before the establishment of cough, renders the latency of the disease, in this case of phthisis, indubitable. But it appears to me impossible to determine when the development of tubercles commenced. For if we look to an earlier period than the six weeks preceding the patient's admission into hospital, that is, to an earlier period than that assigned by her as that of the commencement of her illness—there is no better reason for stopping

short at the period of any one *cold,* than of others that preceded it, inasmuch as in the intervals between them the patient's health was good. However, the size, the number, and the character of the ulcerations of the small intestine, appear to me to show that the pulmonary tuberculous disease, upon which their production depended, existed before the period in question.

The pus effused into the pelvis was the product of recent acute peritonitis, which doubtless supervened within the last twenty-four hours of life. At least, I am induced to form this opinion, both because no symptoms of peritonitis existed when I saw the patient for the last time, and because she was extraordinarily restless during the night preceding her decease, without losing consciousness—a condition which I have observed at the close of other chronic diseases, and only under the same circumstances of causation. Still this view is only conjectural; and my object in indulging in it, is simply to show that even the closing moments of life are not without their interest for the observer.

Case LV. A cook, aged 24, of weak and delicate constitution, of middle height, and having had leucorrhœa before the first appearance of the catamenia, had been six weeks ill, when admitted into the Hospital of La Charité. At the outset she had colic-pains as well as others, of which it was difficult to determine the nature; these pains, rather severe in degree, and unattended with fever during the first weeks, subsequently diminished in severity; fever supervened, and rigors, followed by heat and sweating, frequently recurred in the evening. The appetite failed from the first; soon after, a state of almost total anorexia followed; the patient only took a little food in the mornings, having observed that the colic-pains increased greatly when she eat in the evenings. Slight diarrhœa was brought on by the use of some purgative pills, administered during the first fortnight; scarcely any increase of thirst had taken place; there was no cough. The menses had appeared at their usual time, on the 16th of last month.

July 15th, 1824 (the day following the patient's admission). Face tolerably animated; no headache; strength slightly diminished; chest sonorous; respiration natural everywhere; *no cough, nor expectoration;* nevertheless, nineteen months before,

after an obstinate cold, she had an attack of hemoptysis, which lasted six weeks; this cough returned the succeeding winter; in the intervals between these two attacks of cough, and even since then also, the respiration had continued less free than before, but there had been no cough; heat of skin inconsiderable; pulse very slightly more frequent than natural; some rigors the evening before; tongue broad, tolerably moist, light coffee colour; mouth clammy, and bitter-tasting; no thirst; warm drinks produce nausea,—cold ones, colic-pains; abdomen, generally, somewhat full and tender under pressure; epigastrium painful, the pain being increased by movement of every kind, and during the evening febrile paroxysm; colic-pains from time to time; bowels relieved twice every day.

Solution of syrup of gum; linseed enema; emollient fomentations; hip-bath; two soups.

No cough occurred from this time till ten days before death, which took place on the 26th of August. The patient ascribed this cough to her being obliged to uncover herself in the night from her being distressed by heat, paid little attention to it, and her weakness prevented me from auscultating the chest. There was more or less considerable heat of body in the evening, sometimes preceded by rigors, and always followed by sweating. Towards the close, the pulse became very frequent, small, and weak.

On the 17th of July, the patient vomited some mouthfuls of bile; soon after this she began to vomit more copiously and frequently, almost daily indeed, and she sometimes filled in one day several spitting-vessels with yellow or green coloured bile. The epigastric pain became very severe, was accompanied with sensation of heat, increased somewhat before the vomiting, and after the middle of August ceased to be felt, except when this occurred. The abdomen increased still further in size, and was frequently hot and painful; the appetite, generally speaking, very poor, or altogether absent, sometimes improved, and the patient then eat a little soup or an egg with relish, and neither one nor the other excited vomiting.

Her debility increased rapidly. On the 26th of August, she felt herself dying at the time of the visit, and pointed out to me some lenticular blueish spots which had just appeared on the chest and hands. She died the same day at 3 p.m.

Sectio Cadaveris; *eighteen hours after death.*

External appearances. Last stage of marasmus; no cadaveric rigidity; the spots observed on the day of death are still visible; no vibices.

Head. Brain firmer in the upper than in the lower half; two small spoonfuls of serosity in the lateral ventricles; pons Varolii and cerebellum of but slight consistence.

Neck. Epiglottis, larynx, and trachea natural.

Chest. Right lung closely and universally adherent to the costal pleura; the upper lobe crammed with gray semi-transparent granulations, more or less opaque in the centre; none in the lower lobe. Loose cellular adhesions of the left lung, gray granulations throughout it, with a tuberculous cavity of medium size at the apex, lined with a semi-cartilaginous membrane resting upon healthy pulmonary parenchyma, or upon granulations, and covered with plastic exudation. Bronchi healthy.—Heart rather small; aorta natural.

Abdomen. The viscera and walls of the abdomen are invested almost over their entire surface by a greenish-coloured pseudo-membrane, reflected on itself, or by a matter of yellowish white colour and dull aspect, more or less firm and brittle, in a word tuberculous, and deposited in patches more numerous and larger in the cavity of the pelvis than anywhere else.—The stomach, of moderate size, contains a certain quantity of bile; a considerable extent of the fundus is of a blueish white colour, and within that space the mucous membrane extremely thin and as soft as mucus. The same kind of anatomical change existed over a superficial extent of fourteen inches [36 centimeters] near the pylorus. Between this place and the former, attenuation was also observable, but in the form of bands from three to five lines [6 to 10 millimeters] broad, between which the mucous membrane presented the characters of perfect health. That of the small intestine contained some small ulcerations, and was extremely softened throughout. The mucous coat of the large intestine was much less softened; in the rectum it presented two ulcerations, three lines [6 millimeters] in diameter, and also some slight redness.—Liver somewhat redder than natural, and very easily torn. Bile contained in the gall-bladder dirty drab coloured, and of moderate density.—The cavity of the uterus and the upper half of its neck were of yellowish

white colour, and had a dull look and uneven surface: all this was caused by the transformation of the superficial part of their substance into very firm tuberculous matter, about one line [2 millimeters] thick. Underneath this matter, which formed an uninterrupted stratum, appeared besides miliary granulations of the same nature. Elsewhere the walls of the uterus were healthy.

Under whatever point of view we consider this and the preceding case, we find the very strongest similarity between them. Both patients were very nearly of the same age, had the same constitution, the same tendency to obstinate catarrhal affections, and the same gastric symptoms; in both cough—and then but to a slight amount—did not occur till towards the close; and lastly, similar anatomical changes existed in the lungs and mucous membrane of the stomach. In the present, as in the preceding case, the tuberculous affection set in long before the cough; and the hemoptysis which occurred eighteen months before the patient's admission into hospital, with the slight dyspnœa which had continued from that period, would lead to the belief that the development of the pulmonary tubercles took place at that time.

The state of the uterus and of the cavity of the peritoneum deserves attention. A mass of pseudo-membrane covered the anterior wall of the abdomen and all the subjacent viscera; between the two laminæ appeared a substance of dull yellow colour, deposited in patches of variable extent—a substance which might by some persons be regarded as concrete pus. But these characters are those of tuberculous matter, and I have never met with a morbid state of the kind except in phthisical patients—the sole subjects, as far as my observation goes, of the development of tuberculous matter;—besides it is not more difficult to understand the production of this matter on the surface of a pseudo-membrane than on the surface of the ureters, vasa deferentia, and vesiculæ seminales (Cases v and vi); and all these reasons seem to me convincing as to the tuberculous character of the patches in question.

The transformation of the superficial layer of the internal surface of the uterus into tuberculous matter must have been rather rapidly accomplished, as the catamenia had continued natural up to the time of the patient's admission.

It is further worthy of attention, that the development of tuberculous matter in this case was general, and that the morbid product had attained the same degree of advancement in all the organs where it existed. This appears, as I have already remarked, to denote the agency of one and the same cause acting simultaneously on several parts.

The six cases just related are not the only ones of the kind I have collected; two of these, given in an earlier part of the volume, might have been placed here. One of them (Case IV) referred to a man who died after a violent diarrhœa of five months' duration, having had no cough until the last six weeks of life, and in whom I found a great number of tubercles and cavities in the lungs, and very large ulcerations in the intestines. The extent of anatomical change in this instance showed with certainty that the pulmonary tubercles had existed long prior to the cough; and as the diarrhœa probably depended, from the first, on the then commencing intestinal ulceration (which is, as I have already said, one of the dependences of phthisis), it follows that the origin of the tubercles dated equally far back. The other case (Case IX) was that of a young girl, aged nineteen, who had been seven months ill, and only a few weeks affected with cough, when admitted into the Hospital of La Charité. Pectoriloquy existed on her admission, the sputa were ragged; and both these circumstances, as well as others besides, rendered it evident that the pulmonary tubercles existed long before cough had set in.

Hence, out of one hundred and twenty-three cases of phthisis, there were eight, or the fifteenth part, in which the pulmonary tubercles were latent, that is to say, existed from six months to two years before cough set in. This proportion of latent cases, though not inconsiderable, is much lower than that which really exists, if, as I have already said, hemoptysis preceding cough and expectoration, be an effect and not a precursory symptom of tubercle. Hemoptysis of this kind, in truth, preceded the other symptoms of phthisis in seven cases, which I felt, on other grounds, obliged to classify with those following a regular course.

The eight cases of latent phthisis which I have related, are naturally divisible into two classes. In the one, the pulmonary tubercles existed for a greater or less length of time, without

causing cough or expectoration, or even general symptoms of any importance, (Cases IV, LIII, XLV, LV:) in the other, they gave rise to general symptoms of excessive severity, fever, emaciation, loss of appetite had set in, &c., long before cough or expectoration, (Cases IX, L, LI, LII.) In the former class, the mildness of the symptoms might divert the observer's attention from any accurate examination capable of disclosing the real state of the lungs. But, in the latter class, the difficulty of referring the symptoms to any particular organ, and the frequency of phthisis, should early lead us to suspect the existence of pulmonary tubercles, and consequently to investigate closely any local symptoms which might, by possibility, have existed—pains in the sides, or between the shoulders, hemoptysis, &c.—and, above all, to assure ourselves of the state of the lungs, by careful practice of auscultation and percussion. It is, in truth, probable that by these latter modes of investigation phthisis might have been detected in the four individuals belonging to the second class, long before the commencement of cough or expectoration. Hence a powerful reason for having recourse to these methods of investigation in all similar cases, and, generally speaking, whenever emaciation exists, and any doubt can be entertained of the nature of the disease. Besides, the examination of a patient cannot be too perfect, and how can we consider it at all complete, unless the condition of respiration be thoroughly established?

The fact that tubercles may exist for a variable time in the lungs, without giving rise to their ordinary symptoms, is in nowise marvellous; for all diseases (inflammation of the parenchymatous organs, or of the serous membranes, and sometimes even those following an acute course) may exist with this character. But the really remarkable point is the violence of the general symptoms,—the derangement of several functions, the organs performing them being, anatomically speaking, perfectly healthy, while the only organ really diseased might have appeared the only one unaffected. It was, in truth, in cases of uncomplicated latent phthisis, (Cases L, LI, LII,) that the fever ran to the greatest height, and that the disturbance of the digestive functions was of longest duration. This fact corroborates a statement already made, that in the majority of cases, the first febrile symptoms of phthisical persons are due to the pulmonary

tubercles, and not to the secondary morbid changes, such as intestinal ulcerations, &c.

It appears to me impossible, in the existing state of knowledge, to determine, or even to guess at the causes, which thus mask pulmonary tubercles. We cannot, in truth, imagine the lungs to be insensible to their presence, inasmuch as five sixths of the latent class of cases were furnished by the female sex;—while half of these women had had intense fever previously to the supervention of cough, and constitutional suffering denotes as much susceptibility as the more or less marked development of local symptoms. Nor can the peculiarity of these cases be explained by the existence of complications; for in several of them the pulmonary affection was perfectly simple.

I shall again return to the consideration of these cases for the purpose of displaying their connexion with the subject of the causes of pulmonary tubercles.

Similar facts have presented themselves with tolerable frequency to my observation, since the publication of the first edition of this work. Patients belonging to this category had wasted and lost flesh for a certain time, laboured under hectic fever, and were almost invariably tortured with diarrhœa, resisting every attempt made for its suppression. Neither abstinence, opiates, astringents, nor even blisters applied to the abdomen —blisters, which are often employed with such success in simple chronic diarrhœa—had any particular effect in controlling it. And the mere circumstance of the coexistence of hectic fever and diarrhœa—having lasted in some cases so long as eighteen months—has often led me to suspect (and this independently of the failure of all treatment) the existence of tuberculous disease, a suspicion soon converted into certainty by the evidence derived from percussion and auscultation.

CHAPTER III.

DIAGNOSIS.

The greater the danger attached to any given class of diseases, the greater the importance of being able to distinguish these with precision,—and the more necessary does it become to study that part of their history, termed their diagnosis, with all possible care. I shall, for this reason, endeavour to make no omission of importance in this part of my inquiries, which I regard as peculiarly practical. I shall consider the subject in two sections: the one referring to the diagnosis of pulmonary tubercles during the period comprised between their first production and their softening; the other during the period elapsing between the softening and the fatal event or recovery, or, at least, the cessation of the principal symptoms, and the more or less complete restoration of the patients to health.

SECTION I.—FIRST PERIOD.

During the course of this period, as of that corresponding to it in other chronic diseases, the diagnosis may remain for no inconsiderable time a matter of uncertainty; nevertheless the collation of all the circumstances of cases, generally speaking, leads, at a very early stage, to a considerable degree of certainty. I shall pass the chief of these circumstances in review.

In the majority of persons the *cough* originates without appreciable cause, while they still appear in the enjoyment of perfect health; and in a fair number of cases, one, two, three, four, five weeks or more elapse before it is attended with expectoration. The dryness of the cough and the absence of appreciable cause for its existence—conditions so rare in essential pulmonary catarrh—are, in themselves, calculated to afford motive for suspicion as to the true nature of the affection.

Whether *expectoration* occur at the outset of the cough, or at a more or less advanced period of the disease, the sputa are at first clear, frothy, and white, and retain these characters for a period of variable length. This again is not commonly the case in simple pulmonary catarrh.

The same may be said of the *pains in the chest* so common in phthisical subjects. Pain scarcely exists, in truth, in pulmonary catarrh, except behind the sternum; whereas in tuberculous disease it affects the lateral regions of the thorax, or the space between the shoulders. Besides, the characters of the two kinds of pain differ: in phthisis it resembles pleuritic stitches, which in fact it actually is,—while in the catarrhal affection it is constituted by a sensation of heat and tearing of the part affected.

Existing in combination with the two previous symptoms, these pains establish a strong presumption in favour of the actual presence of pulmonary tubercles, and this quite independently of any other symptoms, to be by and by described, and even of the results of percussion and auscultation. For if there be not considerable dyspnœa present at the same time they could scarcely be ascribed to anything but rheumatism, complicating an attack of acute pulmonary catarrh;—and nothing can be more rare than a complication of the kind, especially where, as we have supposed, no appreciable cause is traceable.

Hemoptysis, if at all copious, is above all a most valuable symptom in the diagnosis of tubercles during their first period. Out of upwards of two thousand four hundred patients, carefully interrogated on the point—patients who had neither had a violent concussion of the chest, nor suppression of the catamenia, nor gangrene nor cancer of the lungs—one only had had hemoptysis to any amount. Hence this symptom, combined with those previously enumerated—and the combination is sufficiently common—places the existence of phthisis beyond a question. We can thus, in a tolerable number of cases, recognize the existence of tubercles very soon after their production, by means of a few symptoms, the existence of which is easily ascertainable.

Another circumstance of great importance in respect of the subject before us is, that acute pulmonary catarrh is almost

invariably preceded by *coryza,* which is not the case with phthisis. Hence, the cough may, in itself, at the very outset—taking the word in the strictest sense—remove all suspicion of the existence of tuberculous disease, or, on the contrary, distinctly warrant such suspicion, according as it is, or is not, accompanied with coryza.

It is common to observe *fever* at the outset, or very soon after the invasion of phthisis, more especially in the evenings: fever, on the contrary, rarely appears in pulmonary catarrh, unless it be intense. Fever, consequently, when it exists, gives further certainty to the diagnosis. If *emaciation* have taken place, and be not ascribable to abundant discharges of any kind, nor to any manifest disease of the digestive organs, the nature of the case admits of no further question.

It is no doubt true, that cases have been from time to time observed—and writers make mention of such facts—in which deep-seated suppuration, hectic fever, emaciation, and sometimes cough, coexisted,—that these cases have been considered during life examples of phthisis,—and that, notwithstanding, tubercles have not been found in the lungs after death. But in these cases, the symptoms just passed in review are not observed, and without these, hectic fever and emaciation can do no more —and even this simply on account of the frequency of that affection,—than lead the physician to suppose the existence of tuberculous disease. It remains for percussion and auscultation, under these circumstances, to remove all doubt.

The importance of auscultation and percussion in the diagnosis of tubercles arises especially from the fact that these productions are, as we have already seen, almost invariably developed from the apex to the base of the organs,—while the various metamorphoses they pass through must of necessity produce changes in the sonorousness of the chest, and in the character of the respiratory murmur.

Percussion of the chest often gives natural results during part of the period under consideration. Whatever be the attention with which the process of percussion be conducted—and it always requires a very considerable amount of care in its performance—the chest is often found perfectly and equally sonorous under both clavicles. And this perfectly natural condition of the sound may continue for a long time, without justifying

us in drawing from it any inference as to the non-existence of tubercles; for if these productions be slowly developed, if they be scattered over a considerable surface, and to about the same extent in the right and left lungs, the chest will necessarily continue sonorous, and sonorous to the same degree under both clavicles, for a considerable length of time. But sooner or later the sonorousness under the clavicles diminishes. When the diminution is the same in amount under both clavicles—a rare condition of things—the reality of its existence may be considered ascertained, if percussion, practised one and a half or two inches below the clavicle, give a much clearer sound than immediately above. But, as I have this moment said, such a condition of things is by far the rarer of the two possible ones; the amount of sonorousness is commonly different under the two clavicles, and this difference, whatever be its degree, denotes of itself, quite independently of the symptoms so far considered, the existence of a morbid state of the apex of one of the lungs. Now, as it is in this situation that the development of tubercles commences, our first suspicions naturally turn to phthisis as the source of the difference referred to.

Unequal sonorousness of the infra-clavicular regions may be the result of old-standing pleurisy (which has entailed contraction of one of the sides of the chest) or of vesicular emphysema of one of the lungs. But comparison of the results of percussion and auscultation will remove all such doubts; for if emphysema exist, the respiratory murmur will be found feeble on the most sonorous side; whereas, if the decrease of sonorousness depend on old-standing pleurisy with contraction of the walls of the chest, the diminished force of the respiratory murmur will be detected on the same side as the diminished sonorousness. And the feebleness of the respiratory murmur is uniform or nearly so, in the latter case, which is not the fact when dullness of sound depends on the presence of tubercles.

But a point to which I attach much importance is that, where but slight difference of sonorousness is detected between the two sides, its existence should not be considered actually matter of certainty, until the investigation has been frequently repeated, the observer sometimes placing himself on the right and sometimes on the left side of the patient, while the patient successively assumes the standing, the sitting, and the recumbent

posture. The experience of the most skilful persons shows that in such delicate cases the results of percussion under the clavicle may vary on different occasions; and this variation obviously could not exist, were not percussion sometimes defectively performed by the most practised hands.

The presence of a certain number of tubercles in the lungs does not simply produce diminished sonorousness of the chest, in the region corresponding to their seat; but, even when the diminution in question is slightly marked, entails a decrease of elasticity in the part percussed. This difference, already pointed out by M. Grisolle, in his work on Pneumonia, is sometimes more obvious than that of the sonorousness; and, for this reason, is deserving of much attention.

In proportion as the disease advances, and the number of tubercles increases, the results of percussion become more distinct and decisive. But when the affection runs a very chronic course, these results may retain their character of uncertainty for a considerable time. This fact does not throw any doubt on the utility of percussion, inasmuch as it shows that the anatomical changes existing are at least of slight amount. Percussion is also useful, in cases where it is not required for the establishment of the diagnosis, in assigning, with more or less accuracy, the extent of the local disease. And when the information derived from the rational symptoms is scanty, percussion acquires new importance; for then, associated with auscultation, it is one of the surest, or rather the sole, means of arriving at a diagnosis, or of giving this any tolerable precision.

Auscultation, like percussion, may be incapable of leading to any positive result, even in cases wherein the general symptoms, and those already enumerated, leave but little doubt as to the existence of tuberculous disease. But in the majority of cases, even before the sonorousness of the chest undergoes change, the character of the respiratory murmur is distinctly altered. The murmur is feeble, imperfectly developed, and obscure under one of the clavicles; and when pain has existed on one side of the chest only, these morbid conditions are detected under the clavicle of that side. This character of the respiration becomes particularly obvious, if both sides be auscultated comparatively,—a precaution which should never be neglected. Or, again, instead of a weak respiratory murmur, incomplete in inspiration,

the latter is harsh, strong, blowing, and the expiration harsh, and, as it were, bronchial: all this differs from what exists in the natural state. Nevertheless, if the latter phenomena were limited to the right infra-clavicular region, its amount should be carefully ascertained, before its morbid character could be considered certain. For, in the natural state, a difference commonly exists in the manner in which respiration is accomplished under the two clavicles,—a difference already pointed out by Dr. Gerhard, of Philadelphia, and recognized by other observers also.[1]

In order to ascertain with accuracy the characters of this difference, I studied (together with Dr. Picard, then *Interne* in my wards), the manner in which respiration takes place at the apices of both lungs, as well as the resonance of the voice in the same places, in twenty-two young females, aged from 15 to 20, who had never experienced the symptoms of any affection of the thoracic organs. I made and repeated this investigation with much care, and with the following results.

Except in two cases the sound of inspiration was gentle and soft under both clavicles, and to the same amount under each, in the twenty-two cases in question. One of the exceptional cases was that of a young girl, aged 20, and thin in person, in whom inspiration was less soft, and stronger than in the natural state under the right clavicle. The other was that of an equally young female, in whom the sound of inspiration was stronger and fuller under the left than the right clavicle. The sound of expiration was nearly inaudible under the left clavicle in the majority of cases,—thirteen times out of twenty-two; whereas

[1] Dr. Gerhard expresses himself very much to the following effect, in his work on the Diagnosis of Diseases of the Chest: "The remarkable fact that the respiration is always somewhat blowing at the apex of the right lung, and not at that of the left, had been known to me several years, when I recently dissected a number of lungs for the purpose of ascertaining if the fact were explicable by any anatomical peculiarity. I found that the bronchi distributed to the upper lobe of the right lung issue from the trachea almost at a right angle, while those of the left make a much longer transit, in consequence of the curve described by the left bronchus, as it passes under the aorta: to such a degree that the length of the primary bronchus, on the left side is two inches and a half, on the right one inch and a half. Again, the caliber of the bronchi going to the right lung is almost double of that of the bronchi of the left side. Hence it follows that three circumstances render the respiration more blowing on the right than the left side: 1, The vicinity of the bronchi to the trachea; 2, the straightness of their course; 3, their greater width."

the contrary was the case on the right side, where the sound of expiration was inappreciable in five cases only. In the others, expiration was distinctly audible, and sometimes very much prolonged. This sound, examined on the posterior surface, was inappreciable on the left side in fourteen cases; it was only five times wanting on the right side; and in cases where expiration was audible on both sides, this was more marked and prolonged, sometimes to a very considerable degree, on the right than the left side. In one young girl, besides being prolonged under the right clavicle, expiration was harsh, and, as it were, bronchial in that situation.

Although the facts now analysed are few in number, it appears to me that we may infer from them that slightly prolonged expiration at the upper part of the right side of the chest, is, considered in itself, of little value as a diagnostic sign of tubercles; and that it is much more significant on the left.

While the respiratory murmur is modified by the presence of a certain number of tubercles in the parenchyma of the lung, the resonance of the voice likewise undergoes alteration. This alteration is at first slight in amount, but gradually increases; in such manner that, after the lapse of a period of variable length, actual bronchophony may be detected.

But just as the character of the respiratory murmur is not always the same at the apices of both lungs in the natural state, so likewise does the vocal resonance vary in these regions. Thus, in the twenty-two subjects just referred to, I found marked resonance of the voice under the right clavicle ten times,—in four of these to a considerable amount; whereas such resonance existed under the left clavicle in one case (and here to a slight amount only), but that of a thin female of twenty-four years of age. Posteriorly, on the left side, resonance of the voice existed to a very slight amount in this woman only, at the apex of the lung; whereas it existed on the right side in the corresponding situation, and with much greater intensity, in eight individuals, in whom the expiration was prolonged. Hence it follows, that resonance of the voice, when slight in amount, is not a phenomenon of equal diagnostic value at the right and left apices of the chest. It is likewise inferrible, that it always possesses a certain share of importance on the left side, more

especially if it be not present on the right; whereas the contrary is the case with the latter side.[1]

The respiratory murmur, either of the vesicular or bronchial character, may remain pure and unaccompanied with rhonchus, for a more or less considerable lapse of time, varying with the course of the disease. But a little sooner or a little later (sometimes even before the period at which resonance of the voice commences to be audible) dry or humid crackling, or a few bubbles of sub-crepitant rhonchus, becomes discoverable at the apex of the chest. These phenomena denote the presence of a certain quantity of mucus, which may be secreted long before the softening of tubercles, and while gray semi-transparent granulations constitute the only existing morbid change.

The simultaneous existence, at the apex of the left lung, of slightly prolonged and slightly harsh expiration, slight bronchophony and a few cracklings, in a case where the rational symptoms are very far from decisive, would almost place the existence of tuberculous disease beyond question. Slight alteration of the sonorousness of the chest in the same situation would do so completely.

However, sub-crepitant rhonchus, the bubbles of which present such varieties in respect of size and number, exists in very different affections from phthisis, more especially in capillary bronchitis. But, when depending upon the latter affection, it is invariably observed on both sides of the chest posteriorly, and it commences at the base of the lungs; now the contrary is the case where sub-crepitant rhonchus depends on the first development of tubercles. Hence this rhonchus, if limited to the base of one of the lungs, for a certain time at least, would denote, not simple capillary bronchitis, but symptomatic bronchitis, probably of tuberculous character.

Crackling and sub-crepitant rhonchi, limited to the apex of the lungs for a certain time, are then of great importance as diagnostic signs of pulmonary tubercles, even in cases where no serious change exists in the character of the respiratory murmur, provided a certain number of rational symptoms are

[1] Dr. Walshe, Professor of Pathological Anatomy in University College, London, has established the same facts in an interesting work, which he has recently published, on the Diagnosis of Diseases of the Lungs.

present. But an important question is, whether sub-crepitant rhonchus, thus localized at the apex of the lungs, in cases where no other local symptom exists, and occurring in patients who appear only to labour under a simple catarrhal affection, more or less acute,—whether, I say, this rhonchus is evidence enough in itself to denote the presence of a certain number of tubercles at the apex of the lungs? The following case will show how truly important this question is.

Case LVI. A young man, aged 20, tall, moderately full in person, with a healthy-coloured skin, deep chesnut-coloured hair, and a perfectly well formed chest, fell ill on the 6th of December, 1838, having, until that time, enjoyed perfect health.

On that day the patient had taken a fencing lesson, and left the rooms immediately after, somewhat heated; he felt slight sore throat after this without having experienced any chill: the sore throat continued slightly the following day, and he then began to cough a little. On the 8th, when I visited him for the first time, the face was flushed and excited, the pulse frequent and rather full, the skin hot and moist; he coughed somewhat, expectorated a few greenish sputa, and had no pain in the side: he was perspiring considerably at the time, so that I neither auscultated nor percussed the chest, believing too, as I did, that the case was one of simple cold.

The two succeeding days the patient remained almost constantly in bed, was feverish to a certain degree, and eat little. On the morning of the 11th, the face was bathed in perspiration, the general heat of the body considerable, with moisture all over the surface; pulse 110, rather full and regular; marked oppression of breathing existed; the sputa, tolerably abundant in quantity, were greenish and non-aerated; the chest emitted a perfectly clear sound under percussion, although this was very slightly less clear under the left than the right clavicle. Under the left clavicle, and as far downward as the mamma, a humid sub-crepitant rhonchus, consisting of large bubbles, was audible, and commonly masked the respiratory murmur completely: this rhonchus was not mixed with true crepitation even after cough. When the rhonchus was sufficiently slight to allow the respiration to be heard, this was natural and vesicular, and no bronchophony existed. Posteriorly, on the same side, also at the

apex, the same rhonchus and the same condition of respiratory murmur existed over a surface measuring about three inches and seven lines [9 centimeters] from above downwards: whereas on the right side everything was in the natural state.

Solution of syrup of raspberries; almond emulsion; V.S. to ten ounces [300 *grammes*].

At noon and in the evening the patient's state had undergone no material change, and he was ordered to be bled again. The blood drawn in the morning was surrounded with a great quantity of serosity, and covered only with a thin pellicle; that drawn in the evening displayed the same appearances.

12th. The local symptoms continued as before, except that a few striæ of blood had made their appearance in the sputa; the state of the circulation and of the digestive functions had not changed. I directed the upper part of the left side of the chest to be covered with common diachylon plaster; and prescribed an almond emulsion with about two drachms and a half [10 grammes] of syrup of poppies, and one or two pills, containing something less than the sixth of a grain [1 centigramme] of extract of opium to be taken during the night.

13th. In the morning I found the patient, after a tolerably quiet night, in a state of gentle perspiration, just as on the previous day at the same time; the pulse 100, and rather full; heat gentle; the chest free from pain in every part, even after coughing; there were two sputa covered with a layer of red blood, and there had been no epistaxis; the results of auscultation continued as before; no urine passed.

Pergat; Seidlitz water.

The Seidlitz water produced some motions; and on the 14th, the patient was somewhat cooler than the day before; the night had been quiet; he slept well; the sputa were greenish, thick, free from air, striæ of blood, or livid tinge.

Pergat; omit the Seidlitz water.

15th. Heat somewhat diminished; pulse somewhat less frequent. Auscultation gives the same results as before on the left side, anteriorly; but posteriorly, on the same side, there is sub-crepitant rhonchus from the base to the apex, and some crackling rhonchus audible at the right apex.

Pergat.

16th. The auscultatory phenomena last mentioned continued;

as also the anorexia and the red discoloration of the urine; whereas the body was much cooler, there was no perspiration, and the pulse had fallen to 72.

Pergat; grapes.

17th. The febrile action had disappeared completely; the pulse 65; the patient had lost flesh considerably; results of auscultation as before; he now took only one opium pill at night, and from a little less than five to upwards of six ounces [150 to 200 grammes] of grapes.

21st. Sputa clearer coloured than before, contain a little air; no rhonchus on the right side; and a very little only in some places on the left; the patient was very weak.

Broth; grapes.

23d. Crackling rhonchus, with much larger and more abundant bubbles than the day before, under the left clavicle, although they were still much less abundant than at the outset. Posteriorly, on the same side, there was slight bronchophony; and percussion, carefully practised, produced as much sound on the right as the left side in the corresponding place; the tongue still exhibited a whitish-greenish colour; the patient felt well after sitting up for two hours, in an arm-chair; he eat some soup and French plums.

He continued to improve the following days. On the 29th, the appetite was sharp, the patient eat as when in good health, and could speak of nothing else; coughed a little in the mornings, and expectorated a few greenish sputa only. Percussion was very sonorous, and the respiration pure on the right side; the latter was mixed with crackling under the left clavicle, and posteriorly on the same side over a surface measuring three inches and seven lines [9 centimeters] in height.

The crackling diminished rapidly, and ceased completely a few days afterwards, when the respiration appeared quite natural. Six months afterwards, the patient was in the enjoyment of perfect health. Since then I have heard nothing of him (he was a foreigner), and I have no means of knowing whether his health has continued good.

Here then we have a young man of twenty years of age, of an excellent constitution, habitually enjoying good health, whose parents, too, were very seldom ill, seized with slight pain in the

throat, cough, and rather severe fever, in the month of December, and this without having had a chill. On the fifth day of the attack, the percussion-sound appeared slightly dull under the left clavicle; moist sub-crepitant rhonchus with large bubbles could be heard in the same region and posteriorly at the apex of the lung,—a rhonchus which continued with the same character the following days, then extended backwards and downwards, so as to be audible at the base of the lung, on the ninth day of the affection. This symptom decreased pretty rapidly; the rhonchus was limited in extent, and, more especially, in quantity on the twenty-third day, and soon ceased altogether. The sonorousness of the chest appeared slightly affected only on the first day it was examined; the sub-crepitant rhonchus was not accompanied by crepitant rhonchus at any period of the disease; the respiration, when not masked by the rhonchus, invariably continued vesicular; no bronchophony could be detected at any period under the left clavicle; and, lastly, some few cracklings were temporarily heard at the apex of the right lung, posteriorly. The sputa were striated or stained with blood for two days only, the sixth and the eighth, while the febrile action was still rather severe; two days later, the pulse had nearly fallen to its natural frequency, the heat of skin diminished; and, as we have seen, the convalescence was a rapid one.

What was the real nature of the disease in this case? Was it a deep-seated pneumonia of limited extent, simple acute capillary bronchitis or a tuberculous affection promptly arrested in its progress? The diagnosis, it appears to me, lies between these three affections. In the first place, the very slight dullness of sound, found under the left clavicle at the period of the first examination, might have caused a suspicion of the existence of pneumonia, secondarily entailing capillary bronchitis, had that deficiency of sound manifestly increased at the second examination;—but such was not the case. Besides the patient never had any pain in the side; the sputa never presented the combined characters, or even any of the characters, they exhibit in pneumonia; at no period of the attack was the sub-crepitant rhonchus accompanied with true crepitation, even after cough;

bronchial respiration or bronchophony never existed anteriorly; and the bronchophony, detected on a single occasion posteriorly at two inches and four lines [6 centimeters] below the apex, was circumscribed. All these facts render it impossible to admit that the patient had inflammation (even of very limited extent, and deep-seated) of the issue of the left lung.

Sub-crepitant rhonchus, composed of bubbles of variable size, is one of the symptoms of capillary bronchitis, and denotes the existence of that affection in the present case. At first the rhonchus existed at the apex of the left lung, whence it rapidly extended towards the base posteriorly; whereas it only presented itself on the right side over a very limited space, and for a short time. But was this bronchitis simple, or the effect of an organic alteration of the apex of the lungs? Herein lies the whole question. Had the sub-crepitant rhonchus existed posteriorly and inferiorly on both sides of the chest, and had it spread progressively from the bases to the apices of the lungs, we must unhesitatingly have admitted that the case was one of simple acute capillary bronchitis. Such is, in truth, the course of things in that affection; in which I have constantly found the sub-crepitant rhonchus commence simultaneously, or almost simultaneously, at the bases of both lungs. On the other hand, when I have known capillary bronchitis limited to one lung, this was invariably in cases of organic disease of the organ; and when sub-crepitant rhonchus occurred primarily at the apices of both lungs, it did so in the course of manifest tuberculous disease. Hence, were we to admit that the present case was one of simple capillary bronchitis, we should admit an exception to one of the most general laws in pathology,—one to which I have never met with an exception: now it is obvious that such a step should not be lightly taken. Consequently, although I do not consider the correctness of this view incontestably demonstrated, I am of opinion that it is more natural, and more in harmony with reason and experience, to regard the present case as one of phthisis, inducing secondary development of capillary bronchitis, than as an example of this affection in its primary form. The more rare well-established laws of pathology are, the more close the critical scrutiny to which any facts forming apparent exceptions to those laws should be submitted,—and the more cautious should we be in admitting them to be exceptions, unless no possible objection can be raised

to such a course. Reserve of this kind is the more necessary, as the tendency of the mind is generally an opposite one,—we are, in truth, more prone to destroy than to consolidate.

I shall not attempt to support the view now taken by the fact of the hemoptysis which occurred on two successive days, for it was too inconsiderable in amount to furnish an argument of any importance. The few cracklings, heard at the right shoulder, are more significant; for this is the situation where the crackling, or sub-crepitant rhonchi, are first developed in phthisis. The rapid course of the affection, the prompt and complete disappearance of the general and local symptoms, do not constitute a very strong argument against the existence of tuberculous disease; for we sometimes see phthisis advance with a certain amount of severity, and its symptoms cease promptly, to return after a certain time with greater severity and tenacity than before. Hence the full consideration of the facts before us denotes, if not the absolute necessity of regarding the case as one of acute phthisis promptly arrested in its course, at least the wisdom of suspending one's judgment, and of not too prematurely setting down the case as one of simple acute capillary bronchitis, limited to the apex of the lungs. Lastly, this is a case very distinctly exemplifying the fact that the results of auscultation and percussion, in phthisical subjects, derive almost all their importance from the locality in which they are observed ; the same phenomena, in truth, signify the existence of very different diseases, according to the place in which they are detected.

Modifications of the respiratory murmur, and of the sonorousness of the chest, may arise very rapidly in phthisical subjects in whom the disease does not advance with extreme rapidity. The following case demonstrates this.

Case LVII. A bookbinder, aged 16, tall and thin, was admitted into the Hospital of La Charité on the 23d March, 1825. He had black hair, a healthy-coloured skin, generally enjoyed good health, was very rarely subject to cold, and stated he had been a fortnight ill. At the outset, he suffered from a feeling of weakness, rather severe rigors, and cough, accompanied with clear expectoration: all this, without any appreciable cause. These symptoms continued, the cough excited pain in the pre-

cordial region, and on the eighth day of the affection the patient spit a little blood. The bowels had been confined, he suffered from great thirst, and had almost completely lost his appetite; his weakness was on the increase.

March 25th. *Present state.* Face tolerably animated, somewhat less so, however, than in the natural state; considerable debility (the patient had difficulty in reaching the hospital on foot); cough generally dry, rarely accompanied with clear mucous sputa, containing air; no longer exciting pain at the precordial region, &c. The chest, perfectly sonorous on the left side, emitted a dull sound under the right clavicle, over a surface measuring two inches and four lines [6 centimeters] downwards; and there was slight sub-crepitant rhonchus in the same region; the respiration, slightly confused posteriorly in the corresponding region, was natural elsewhere. There was no oppression of breathing; but the speech became short, when the patient continued to speak for any length of time; pulse 106, regular; the skin moderately warm in the morning, very hot in the middle of the day, hot and moist in the night; scarcely any appetite; thirst slight; abdomen free from pain. Three liquid stools the day before, without pain. The patient was perfectly tranquil, and his posture natural.

Infusion of violets, sweetened; gum potion; V. S. to eight ounces [250 *grammes*]; *fever diet.*

The disease ran its course regularly, and the following were the circumstances noted till the 31st of March, the day of the patient's death. The cough was rare during the first month, and more or less frequent subsequently; the sputa presented no particular character, and were so few in number that they almost always lay dried up at the bottom of the spitting-vessel. Transitory pains occur from time to time in the right and left sides of the chest. The oppression of breathing grew daily more marked during the latter half of the month of May.—May 29th. Marked resonance of the voice under the right clavicle.—April 8th. The respiration was almost tracheal in that situation, as also in the corresponding point posteriorly, and accompanied with gurgling, which changed into crepitant rhonchus two inches and four lines [6 centimeters] below the clavicle. The latter rhonchus extended only a small way downwards. On the left side the respiration appeared natural, except superiorly

and posteriorly, where there were some cracklings heard. On the 13th there was considerable resonance of the voice under both clavicles: on the 28th, distinct pectoriloquy was detected on the right side of the chest at the summit and all round; doubtful pectoriloquy on the left side. From that period to the close of life, auscultation was practised frequently, without leading to the discovery of anything new. From the 29th of March the sound of the chest under the right clavicle became daily more dull, and the space within which the dullness existed more extensive.

The skin was very hot in the evenings; perspiration occurred frequently, almost every night, without previous rigors.—On the 25th of March the pulse beat 95; soon after this it rose to 100, never fell below this afterwards, and from the 15th of May rose to 120.

He suffered very little from thirst; and had scarcely any appetite: his food was limited to a few rice-creams and an occasional fresh egg. On the 11th and 12th of May he vomited bile several times; this symptom did not recur afterwards. The epigastrium was always free from pain; the bowels acted seldom, and the evacuations were generally somewhat liquid.

On the 26th of May the left clavicle and the hand and fore arm on the same side were more or less œdematous. This œdema continued increasing gradually till the patient's death. On the morning of the 30th the features were slightly changed, the face was expressive of fright: this was no doubt caused by the extreme dyspnœa under which he laboured. The patient died the following day at three o'clock after having had slight delirium.

Sectio Cadaveris; *twenty-nine hours after death.*

External appearances. Slight œdema of the lower extremities, the left fore arm, and the left side of the face. No cadaveric rigidity.

The head could not be examined.

Neck. Mucous membrane of the epiglottis somewhat pink coloured, otherwise healthy. An ulceration with pale coloured edges and of little depth at the point of union of the chordæ vocales.—Trachea of a bright red colour throughout its entire extent, studded with small oval ulcerations, of about two lines [4 millimeters] in superficial extent, looking as if punched out of the mucous membrane, which was of natural thickness and consistence everywhere.

Chest. Some elongated thick adhesions at the apices of both lungs, fewer in number on the left than the right side. Upwards of three quarters of a pint [$\frac{1}{2}$ litre] of clear serosity in each of the pleuræ.—The upper lobe on the right side was more or less firm, and presented several tuberculous cavities at the apex, communicating with the bronchi; the largest of these cavities did not exceed the dimensions of a small walnut. Their walls were unprovided with pseudo-membrane, and formed of a rather opaque tissue, homogeneous, of grayish and greenish colour, tolerably firm, non-granular, yielding a turbid fluid of the same colour under pressure. In the midst of this tissue which occupied the entire of the upper lobe, appeared several small cavities, and an abundance of irregularly circumscribed tubercles. There were some tubercles of the same kind, but no cavity, at the upper part of the lower lobe, the base of which was somewhat loaded with blood, and contained a few semi-transparent granulations. Morbid changes of the same kind, but to a much less extent, existed in the left lung.—The bronchi on the right side were much redder than those of the left, and presented some small ulcerations. The heart was of good size; and the aorta perfectly healthy.

Abdomen. Upwards of two pints and a half [1$\frac{1}{2}$ litres] of reddish clear serosity in the abdomen.—Œsophagus healthy except at the cardiac extremity; here its walls, to an extent of one inch and two lines [3 centimeters] were very thin and easily torn; it presented internally a blueish aspect, and the mucous membrane, generally attenuated, was altogether deficient to an extent of fifteen lines [30 millimeters].—The stomach was rather large, and contained a small quantity of turbid fluid; and presented in certain situations the same blueish aspect as that visible in the lower part of the œsophagus,—namely, at the upper part of the fundus over an uninterrupted surface as large as the palm of the hand, and besides these were some bands, reaching thence to within two inches and four lines [6 centimeters] of the pylorus, from three to four lines [6 to 8 millimeters] in width, by from three inches and seven lines to four inches and eight lines [9 to 12 centimeters] in length. In all these places the mucous membrane was excessively thin, as soft as slightly viscid mucus, and semi-transparent; in some spots it had completely disappeared. In the interspaces between these diseased parts the

tunic was somewhat softened, without change of colour.—Duodenum perfectly healthy.—Mucous membrane of the small intestine of natural colour and thickness, slightly softened, and presenting in its lower two thirds about forty small ulcerations, measuring in superficial extent from four to six lines [8 to 12 millimeters], and almost all of them seated on the glandular patches of Peyer. Their fundus and borders—to a distance of two lines [4 millimeters] around—were grayish coloured, and formed of the submucous tunic in a very slight state of thickening.—Pultaceous, yellowish fæces in the large intestine. Mucous membrane softened throughout, more especially in the cæcum, where its consistence did not exceed that of mucus; it exhibited several ulcerations of a superficial extent of seventy-five lines [150 millimeters] or somewhat more in the cæcum, and the ascending and transverse colon. The edges of these were somewhat prominent, the fundus blackish and formed of the submucous tunic, but slightly thickened. Opposite the ileo-cæcal valve was a grayish patch partially ulcerated, exhibiting a tolerably large number of tuberculous granulations, which appeared as it were incrusted in the submucous tunic. The latter was more or less thickened throughout the entire length of the intestine.—Several mesenteric glands, nearly uniformly distributed through the mesentery, were uneven, more or less voluminous, reddish, and partially transformed into non-softened tuberculous matter.—The other abdominal viscera were in the natural state. The bile contained in the gall-bladder blackish and very viscid.

This case is among the number of those deposing, in strongest terms, in favour of auscultation and percussion. When I examined the patient for the first time, it was on the seventeenth day of an attack which might have been considered one of simple acute pulmonary catarrh. But the absence of appreciable cause for the attack, and the occurrence of slight hemoptysis on the eighth day induced me to practise auscultation and percussion with care; and I found the respiratory murmur altered in properties, weak, and mixed with sub-crepitant rhonchus under the right clavicle, to a distance of two inches and four lines [6 centimeters] downwards. I also found the chest less sonorous under percussion in that situation than

elsewhere. These facts led me unhesitatingly to pronounce the case one of phthisis, although the general state of the patient, and the short duration of his illness appeared by no means very favorable to that diagnosis. The progress of the symptoms, however, soon established its accuracy,—I mean the pectoriloquous resonance of the voice under the right clavicle. If we reflect upon the anatomical course followed in the development of pulmonary tubercles, we must admit that the diagnosis made was no less easy than natural; I shall consequently not dwell longer on the point.

The diagnosis of phthisis may also be sufficiently easy soon after its outset, although the progress of the disease be not so rapid as in the instance just given. The following case, occurring in my wards, and the notes of which were taken by M. Cossy, supplies the proof of this.

Case LVIII. A labourer at the water-side, aged 39, robust, of strong constitution, and, generally speaking, enjoying good health, was admitted into the Hospital Beaujon on the 5th of March, 1841. Born in Paris, where he had always lived, supplying himself with nourishing food, and rarely committing excesses, the patient stated he had been three weeks ill, and had only ceased to work within the last eight days. At the outset he coughed and expectorated white sputa, without any assignable cause; the appetite and strength remained unaffected. Fifteen days later the cough and expectoration increased, heat and abundant perspiration, without rigors, supervened, as also dull pain in the right side of the chest, accompanied with a sensation of to and fro, or circular motion, thirst and loss of appetite; he now took to his bed. The bowels had continued regular throughout; and the patient, who lived in the neighbourhood of the hospital, came there on foot.

6th. He lies in various positions indifferently; face tolerably high coloured, expressive of no suffering; intelligence unaffected; memory good; functions of sense natural; respiration easy; cough rare; sputa mucous; chest well formed; slight pain in the right side, increased by deep inspiration; percussion equally clear under both clavicles; somewhat less elasticity under the right than the left; respiration vesicular everywhere; expiration slightly prolonged under the right clavicle,

and posteriorly, on the same side in the corresponding region; here was also slight bronchophony, but no rhonchus: on the left side all was natural. The heat was moderate, with slight moisture of the surface; the pulse 68, tolerably full and regular; the tongue moist; scarcely any appetite.

Decoct. althææ for ptisan; gum potion; two broths.

No change during the three following days.

10th. The pain had changed its place, having moved since yesterday to the right side, one inch and two lines [3 centimeters] above the nipple; from time to time small cracklings were audible here over a surface one inch and two lines [3 centimeters] in breadth; the expiration as before under the right clavicle; the sputa slightly pinkish, containing but little air, some of them opaque, and filling about a third part of the spitting-vessel.

Lemonade; V.S. to about five ounces [150 *grammes*]; *fever diet.*

11th. The pain had decreased since the bleeding; pulse 60; the rest as before.

Pergat; sine venesectione.

12th. The blood drawn the previous day was covered with a firm non-infiltrated buff, surrounded with a tolerably large quantity of serosity; the pain had almost completely disappeared; no crackling rhonchus could be detected even after the patient coughed; the sputa were small in quantity.

20th. Improvement in the general state of the patient; a few small bubbles of mucous rhonchus under the right clavicle; respiration pure near the nipple; complete apyrexia.

Pergat; two soups.

27th. Cough rare; sputa small in quantity, free from any particular character; no pain; percussion-sound somewhat dull under the right clavicle, where also a little obscure sub-crepitant rhonchus is heard at the end of expiration, as low down as the nipple.

April 3d. The dullness of sound under the right clavicle continues as before, the expiration is bronchial here, without rhonchus. In the region of the right nipple the percussion-sound was perfectly clear, the respiration weak, accompanied with crackling rhonchus to a small amount, and from time to time with friction-sound. The emaciation diminished; he coughed but seldom.

The patient left the hospital on the 5th of April, being then sufficiently strong to resume his ordinary occupations.

I have had no information respecting him since; but fortunately this is of no great importance in respect of the matter under consideration. Notwithstanding the extremely slight importance of the general symptoms, and the want of very marked character in the local ones, we are forced to admit that the patient was phthisical, not only at the period when he left, but also when he was admitted into, the hospital. In truth, after suffering for a fortnight from cough of trifling severity, which did not prevent him from working, the patient was seized with slight fever, and some pain in the right side of the chest, lost his appetite, and strength, and felt himself obliged to keep his bed. Eight days later he came to the hospital, and I found him free from fever; his chest was then equally sonorous under both clavicles, but less elastic under the right than the left; prolonged respiration existed under the right clavicle, and posteriorly in the corresponding region; the voice resounded somewhat more posteriorly than in the natural state; the pain continued. Four days after, this pain changed place, and became limited to the right nipple, where small cracklings could be detected from time to time. Venesection, practised that day, was followed by mitigation of the pain, which soon disappeared. Seventeen days later the sound was somewhat dull under the right clavicle, where a little sub-crepitant rhonchus might still be detected; and eight days after this, when the patient left the hospital (one month after admission, and fifty days after the invasion of the first symptoms), the same dullness of sound continued,—expiration had the bronchial character under the right clavicle,—some cracklings, and a sound having the friction character, opposite the right nipple, reached the ear from time to time. The patient, who had always been free from fever during his stay at the hospital, commenced to recover his flesh. This series of symptoms can obviously have depended on phthisis alone.

It is to be remarked that the cough came on without appreciable cause, and was neither preceded by nor accompanied with coryza, contrary to what generally takes place in cases of essential pulmonary catarrh. The fever, instead of coming on with the first symptoms, as it does in the latter affection, did not

commence till fifteen days after. This examination of the general symptoms, considered in themselves as well as in respect of their mode of progress, must necessarily lead us to the same conclusion as that of the local class.

Among the latter, the pain assuredly deserves particular notice. Dull, and producing at first a sensation of to and fro motion, it subsequently became sharp, was accompanied with crackling rhonchus, and slight friction-sound, and exasperated by respiration, like the pleuritic stitch. The sensation of to and fro motion, mentioned by the patient on his admission, was, no doubt, the result of the collision of pseudo-membranes developed on the right side; and the friction-sound detected on his last examination corroborates this view. It is even probable that the crackling sounds which existed in the same place were dependent on the same cause; for if *reticulated* pseudo-membranes rub against each other, the resulting sound will be, not a manifest friction-sound, but something more or less resembling crackling sounds, the size of which will be proportional to that of the division of the rete.

It is, besides, perfectly evident that the cessation of the fever, the re-establishment of all the functions, more especially of those of digestion, and the recovery of strength, cannot throw the slightest doubt on the accuracy of the diagnosis. We can only conclude therefrom that in the present, as in a certain number of other cases (unfortunately but too rare), the tuberculous disease was stayed in its progress, or at least ceased to be attended with general symptoms. Here are circumstances well calculated to elude the sagacity of the physician, or at least to create doubts in his mind as to the positive results of auscultation and percussion. But were the symptoms, such as they have been described on the patient's discharge from the hospital, to continue in the same state for years, still the diagnosis should be firmly maintained: for on the one hand, as has already been said, the symptoms indicated could depend on tubercles alone; and, on the other hand, phthisis may stop short in its progress. Thus I saw, some months ago, one of Napoleon's generals who had been attacked twenty years before with cough, oppressed breathing, hemoptysis, &c. &c.; since that time his health had always been uncertain, he had spit blood in small quantity, from time to time, and suffered from constant cough, and frequent pain on the right side; and, when I examined him, the sound was dull from the

right clavicle to one inch and two lines [3 centimeters] below that bone, and the respiratory murmur obscure, and mixed with some crackling rhonchus. What doubt can be entertained that this patient, who had always continued thin from his first hemoptysis, was tuberculous from that hour; and that, consequently, the local disease, ascertained by means of percussion and auscultation, remained stationary, at least to all appearance, for a period of twenty years? Another reason for adhering to the diagnosis given is that we see patients who, after having experienced symptoms resembling those enumerated—after having had delicate health, cough, and, from time to time, slight attacks of hemoptysis, during a space of eight or ten years—are seized with the severest symptoms of phthisis, the chief seat of which is the side primarily affected, and which carries them off with great rapidity.

The elements of the diagnosis might be even less numerous than in the cases hitherto quoted, without that diagnosis being on this account less sure. The following case appears to me to place this fact beyond the reach of question.

Case LIX. A child, aged 14½ years, lively and intelligent, was seized with cough and fever, without assignable cause, in the month of June last. The fever, cough, and anorexia (which soon joined the other symptoms) continued, and on the tenth day of the attack I was called to the little patient. The fever and cough, which was dry, continued; the child had lost flesh, and complained for some days of pain under the left clavicle,—this pain was sharp and increased by movement, and by the gentlest percussion or pressure. The respiratory murmur was weak in the same situation, perfectly pure elsewhere; and percussion, most carefully practised several times on several successive days, was found a little less sonorous and attended with a sensation of slightly less elasticity under the left than the right clavicle. The difference of sonorousness and elasticity was very inconsiderable: and, nevertheless, in consequence of its seat, of the pain in the same situation, of the dryness of the cough, the fever, and the absence of appreciable cause for the attack, I was of opinion that the case was one of phthisis. An application of leeches to the painful place was followed by alleviation of the pain, without any obvious change arising for the better in the cough and fever. Three weeks

after, the cough and fever continued, though with diminished intensity; the state of the left lung remained very much as already described: there was very considerable dyspnœa, and the patient had lost flesh very materially. Nevertheless he began to eat and recover his strength, and was removed a few leagues from Paris. He now took a little exercise, and his appetite improved rapidly. But after a fortnight's sojourn there (he had never ceased to cough and suffer from dyspnœa, which was perfectly obvious to every one) he was seized with sharp pains in the right side of the chest, accompanied with a good deal of fever; three days after, I found considerable effusion on the same side. This effusion, which was not absorbed till three months after, was attended from the first with the local symptoms of tuberculous disease of the apex of the lung on the same side. These symptoms quickly increased in severity and distinctness, in such manner that before the expiration of six weeks, such emaciation, as to give the patient the appearance of a skeleton almost, large and abundant gurgling at the apex of the right lung, marked hectic fever, &c., too plainly indicated the nature of the case.

I shall not dwell further upon this case, which stands in no need of commentary. I shall confine myself to this remark, that the really important point in the diagnosis of an affection so well understood in respect of its symptoms and their progress as phthisis, is the exact knowledge of the state of the patients, and of the mode of sequence of their symptoms. Provided, be they ever so slight, these symptoms have followed the course of those appertaining to phthisis, if they do not answer to any other affection, and have not been preceded by the special causes of other diseases, then the existence of phthisis must be concluded.

But the diagnosis of the first period of phthisis is not only founded on the existence of dry cough, hemoptysis, and fever, and on the comparative results of auscultation and percussion, &c.; the diagnosis is not always arrived at directly: in certain cases it is arrived at indirectly through the aid of certain laws of pathology and pathological anatomy, the importance and reality of which are demonstrated by daily experience.

Thus double pleurisy—that implicating both sides of the

chest simultaneously—is not, as I have already said, simple or essential. It depends, on the contrary, on some serious affection of the pulmonary parenchyma, sometimes on gangrene of the organ, much more frequently on tuberculization. And as the latter affection is incomparably more common than the other, it follows that double pleurisy denotes almost with certainty the existence of tuberculous disease,—the diagnosis of which would sometimes escape the sagacity of the most practised observer, were he unacquainted with the law in question.

Ulcerations of the larynx have the same signification in this point of view as double pleurisy, for they are almost exclusively (setting aside cases of syphilis) observed in tuberculous subjects. Hence, when the existence of such ulcerations is fully established, we are justified, if the patient be free from syphilitic diseases, in inferring the existence of phthisis, even though all local symptoms of pulmonary tubercles be wanting.

On the other hand, as tubercles may be, and actually are very frequently, developed simultaneously in a multitude of organs; as in some of these organs they determine special symptoms peculiar to themselves; and as, lastly, tubercles do not form, after the age of fifteen, in any organ without existing also in the lungs,—it follows that the moment such special symptoms appear, the presence of pulmonary tubercles may be inferred. Thus from the moment that chronic peritonitis manifests itself—a form of the disease which I have for the last twenty years never met with except in tuberculous subjects—provided it cannot be ascribed to cancer of any of the abdominal viscera, the individual in whom it presents itself must be regarded as phthisical, even though he neither coughs nor expectorates, and though auscultation and percussion give no unnatural results. More than once I have under these circumstances made the diagnosis in question, during the period of my clinical lectures at La Pitié; and the opinion, which appeared rather hazardous to some well-informed friends, was justified by the post-mortem examination.

What I have just said respecting chronic peritonitis is perfectly applicable to that form of meningitis which accompanies the development of tubercles and gray semi-transparent granulations in the meninges. This form of the disease is, in truth, as we have seen in an earlier part of this work, peculiar to phthisical subjects; so that if the symptoms of the affection were to

occur in a person enjoying (at least to all appearance) good health, and in whom nothing unusual was detected by auscultation and percussion, still the presence of tuberculous disease of the lungs is a matter of necessary inference. Case XXVIII would in itself justify this statement. Previously to the invasion of the meningitis, no symptom existed in the individual to whom it refers, capable of disclosing the existence of tuberculous disease of the lungs,—an affection which, it is true, could not have been of very long standing at the time. Auscultation practised after the invasion of the cerebral disease led only to negative results; and the symptoms of meningitis alone allowed me to diagnosticate the malady of which the post-mortem examination proved the presence.

Uninterrupted diarrhœa of long duration—from six to ten months or more—accompanied with emaciation to a greater or less amount, persisting in spite of abstinence, opiates, and blisters to the abdomen, is almost peculiar to phthisical subjects. Here then is another condition, which in a certain number of cases will lead to the diagnosis of pulmonary tubercles, that had been neither announced by cough, expectoration, hemoptysis, nor pain in the side.

Yet, notwithstanding all the resources furnished by the existing comparatively advanced state of pathology, the practitioner may still in some rare cases find it impossible for a long period of time to make any diagnosis at all, or at least feel that he cannot form an opinion with any certainty of being correct: this uncertainty may indeed continue to the very last. The following case will justify this assertion.

Case LX. A young girl, aged 20, generally speaking enjoying good health, and regular for the last five years, was admitted into the Hospital Beaujon on the 19th of November, 1839, stating that she had been ill eighteen months and a half. Her illness had commenced with rather severe colic-pains, accompanied with gaseous distension of the abdomen and borborygmi; these symptoms soon disappeared, but recurred after the lapse of a fortnight or three weeks. The same was the case for the first ten months; and if the statements of the patient were to be credited, it would appear that she had sometimes continued a month at a time free from pain or tympanitic distension,— after

which the symptoms recurred at increasingly short intervals, to such a degree that eventually they became nearly constant. The appetite had continued good; it had even been greater than in perfect health for the first fifteen months, and consequently at a period when the pain and distension of the abdomen had already become constant or nearly so, and there was no diarrhœa. But the appetite had failed considerably the last three weeks; a state of complete anorexia almost existed at the time of the patient's admission; and the abdominal suffering then increased after meals.

These symptoms, which appeared to denote the existence of some obstacle to the circulation of the fæces along the intestine, led me to commence by prescribing Vichy water and alkaline baths; they produced no improvement.

January 10th, 1840, (fifty days after the patient's admission.) The symptoms enumerated were now continuous, with paroxysms every hour or half hour, or thereabouts; on these occasions the abdominal pains, which were very acute, were compared to cramps, the abdomen became tense and knotted on the surface, and pressure displacing the air in the bowels produced a gurgling sound audible at a distance. Still the appearance of the face was natural, the colour fresh, the malar bones of natural colour; she had lost flesh to but a slight amount; the intellectual faculties were in good condition; the organs of sense in the natural state, as likewise the pulse and skin. The patient had neither rigors nor perspiration; declared that she did not cough, that she had no pain in the chest, and that the bowels acted seldom. The Vichy water, having been taken without successful result, was exchanged for infusion of mint; she had a small enema of lime-water every day.

Until the beginning of March, the patient's state presented no remarkable change. The colic and tympanitic distension continued as before, or nearly so; vomiting occurred from time to time; the appetite was completely gone; she had lost flesh to a moderate amount, and coughed so seldom, that the persons in the neighbouring beds declared that she did not cough at all. She had only two or three motions weekly; the lime-water, at first administered in enema, was soon given by the mouth, but with no better success.

March 4th. The abdominal pain grew more intense than usual.

5th. The pain was extremely severe, and the least pressure on the abdomen insupportable; the features were decomposed, the pulse very frequent; the intellectual faculties unaffected.

Forty leeches to the abdomen.

6th. The symptoms had acquired additional severity; the abdomen was excessively painful; the pulse 140, and filiform; she vomited repeatedly.

Leeches to the abdomen.

7th. The patient expired at 3 p.m.

Sectio Cadaveris; *forty-two hours after death.*

External appearances. Inconsiderable emaciation; slight œdema of the lower extremities; abdomen large.

Head. The entire encephalon natural.

Chest. Lungs generally adherent to the ribs, the adhesions being composed of well-organized, thin, transparent cellular tissue, much closer at the apex of the right lung than anywhere else. At the apex of the left lung, some tuberculous masses, the largest of which did not exceed the tip of the little finger in size, and four small cavities of no greater dimensions. On the right side, a few grayish semi-transparent granulations at the apex; throughout its entire extent this lung was somewhat firmer than the left.—The heart in no respect remarkable.

Abdomen. A moderate quantity of sero-purulent fluid, free from smell, escaped when the abdomen was opened. The convolutions of the small intestine were very large, pushed the diaphragm upwards as far as the fourth rib, contained extremely fetid gas, and were agglutinated together by yellowish pseudo-membrane, soft and easily torn; the peritoneum was free from vascularity. At a distance of an inch and a half or two inches [4 or 5 centimeters] from the cæcum, these pseudo-membranes presented a blackish coloured patch, of the size of a shilling, free from perforation. In the situation of this slough the intestine measured only six lines [12 millimeters] in diameter; and above this contracted part a great number of ulcerations, varying in depth, were found scattered over a space measuring from four inches to four inches and eight lines [10 to 12 centimeters] in length; one of them appeared to have gone through the entire substance of the intestinal walls, and reached to between the laminæ of the mesentery. The intestine contained a great quantity of yellowish substance, of good consistence in the lower part;

the walls, especially the muscular coat, were thick throughout their entire extent.—The colon was reduced to a very small size, and contained very little fæces.—The liver, spleen, and kidneys presented nothing remarkable.

Notwithstanding the numerous and important details which are deficient in this case, it is still one of much interest. The first symptoms observed were, it will be readily admitted, little calculated to draw the observer's attention to the thoracic organs; nor were those subsequently noticed more so, for the cough was extremely slight. After an illness of twenty months, there was but slight loss of flesh, which the vomiting and severe abdominal pain satisfactorily accounted for; the patient was free from fever, and her colour excellent. Now, viewing the local symptoms only, namely, those dependent on the digestive organs, the only malady which really could suggest itself to the mind was obstruction of the bowel. I question even, when we consider that the general symptoms commonly attending phthisis were absent, that the real state of things would have been more accurately ascertained, had auscultation and percussion been carefully practised on the patient's admission. For if the small cavities found in the lung had not existed at that period, the number of tubercles was not in itself sufficient—at least such was presumably the case—to affect, in a very obvious manner, the sound of the chest in the corresponding region. On the other hand, in consequence of the extreme slowness with which the development of the tubercles took place, it is doubtful whether the respiratory murmur would have been materially modified at that time. And if the small cavities had existed in November, and bronchial respiration with a certain amount of bronchophony, had been detected at the apex of the right lung, it might have been supposed that these phenomena depended rather on dilatation of the bronchi than on the presence of tuberculous cavities, reasoning upon the absence of fever, and of the general symptoms of phthisis. Here, then, is a case of phthisis which must have escaped detection during the first and even the second period. However, I may observe, that contraction of the small intestine, to a very variable amount it is true, is not very rare in phthisical subjects in the situation of ulcerations of the jejunum and ileum. This contraction must, and actually does, entail in some cases abdominal symptoms

resembling those suffered by the patient before us; and here was a sufficient motive, especially in the absence of the general symptoms of cancer, which also leads to similar contractions, to arouse the attention to the possible existence of tuberculous disease. I do not mean to say that these considerations, coupled with the results of careful auscultation and percussion, might lead to a distinct and solidly-established diagnosis; I simply affirm that, while they did not remove all uncertainty, they might have put the observer in the way of discovering the truth.

This case is one of those exhibiting, in the most striking manner, the serious character and almost infinite variety of the phenomena which tubercles are capable of producing, far away from the organs principally and primarily affected. Like a multitude of others, it should concur in sustaining the zeal of observers in the study of this most common and most fatal disease, which even still stands in need of most extended inquiries for its thorough elucidation.

Let us now pass to the consideration of the diagnosis of the second period of the disease.

SECTION II.—SECOND PERIOD.

The morbid changes existing in the second period are of more serious character and greater extent than in the first; the local and general symptoms become more severe and more marked, and the diagnosis is rarely a matter of difficulty. The results of auscultation and percussion especially merit attention in the present point of view.

The *sputa*, more or less thick and yellowish at the close of the first period, become greenish, and striated with whitish lines at the commencement of the second. They increase daily in thickness, and soon grow rounded in shape, nummulated, as it is called,—characters which, as we have seen already, are almost peculiar to phthisis. *Pains* in the chest supervene, if they have not already appeared, and continue if they have. They are accompanied or not with pleuritic effusion, are generally more severe than during the first period, and have the same signification as then. *Hemoptysis* takes place pretty frequently, but is not accompanied with any particular circumstances. Hence, among the

local symptoms, the sputa so far alone present different characters in the two periods of phthisis.

In the second period the results of percussion and auscultation present modifications more or less complete and rapidly effected, and which daily grow more decisive.

The *sound* of the chest becomes gradually less clear under the clavicles, or one only of them, until it lapses into absolute dullness. The extent of surface, thus deficient in sound, varies; not unfrequently corresponding to the entire of the upper lobe. This latter circumstance is easily intelligible, inasmuch as in one third of the patients whose cases I observed, the entire upper lobe of one of the lungs was transformed into tubercles, gray semi-transparent substance, or cavities decreasing in dimensions from the apex to the lower part. The dullness of sound, thus limited and carried to this amount, suffices—(in subjects who have lost but little flesh and in whom the disease has advanced slowly) independently of information of any other kind, the inspection of the sputa, &c.—to denote the existence of tuberculous disease.

While the changes referred to are effected in the character of the sputa and in the sonorousness of the chest, others are observed in the phenomena of *respiration*. This is not only rough, harsh, and prolonged in expiration, but it becomes bronchial or perfectly tracheal under the clavicles where the percussion-sound is dull. It is also commonly accompanied with crepitant rhonchus, composed of large bubbles, more or less moist, sometimes closely resembling the noise produced by a dry osier when twisted, or like that made by a leather shoe-sole when bent, or like actual gurgling. The *resonance of the voice* is much louder than during the first period; the bronchophony strong, and sometimes very noisy, so much so as to be disagreeable; and pectoriloquy, accompanied with cavernous respiration, becomes audible. The space in which these phenomena exist is at first very limited in extent; but it increases daily; and when numerous cavities exist in the upper lobe, the respiration is bronchial and more or less tracheal over the entire surface corresponding to it. The gurgling and various kinds of rhonchus mentioned exist within the same space; but these peculiar characters and those of the tracheal respiration are gradually lost as the examination is made farther from the cla-

vicle,—that is to say, they are most marked where the deposition and subsequent transformations of the tubercles themselves, are earliest effected. Pectoriloquy becomes daily more manifest, without however ever becoming audible over the entire surface corresponding to the upper lobe. It is scarcely necessary to observe that the same phenomena occur at the same side posteriorly, at the apex, but generally over a less extensive surface, and with various degrees of intensity. The modifications of auscultation and percussion are rarely precisely the same at the anterior and posterior surfaces of the chest.

However, though pectoriloquy and tracheal, bronchial, or cavernous rhonchus denote the presence of a cavity, they do not determine its source; and were we to conclude from the presence of that symptom the existence of phthisis, in cases where the general symptoms of the affection were absent, we should be very liable to error. The following case proves this.

Case LXI. A labourer, aged 59, of middle stature, and not strong constitution, had been short-breathed from infancy, and much more so than before within the last ten years, from the invasion of pulmonary catarrh from which he had never since been free. This catarrh diminished during the summer, was very troublesome in the winter, and he then lost flesh considerably. The cough and appetite had progressively diminished for the last six months. He had lost all appetite for the last month, the cough had increased, the weakness become more marked than before, and he had given up work altogether. He had never had either hemoptysis or pain in the chest.

30th of October, 1824 (the day following his admission). Face pale; slight œdema of the lower extremities; he walks slowly and with difficulty; cough moderate in amount; sputa opaque, greenish, without yellowish striæ; respiration almost perfectly tracheal; a sort of large-sized crepitant rhonchus under the right clavicle, and posteriorly, on the same side, in the corresponding region; marked resonance of the voice; imperfect pectoriloquy in the same places; chest sonorous all over the surface; pulse very slightly hurried; tongue natural at the edges, of a light coffee colour in the centre; thirst rather urgent; appetite completely gone; abdomen full, and the seat of obscure fluctuation; diarrhœa and night-sweats for the last fortnight.

Ptisan of rice and triticum repens; frictions with tincture of digitalis; two rice-creams.

Until the 19th of November, the day of his death, the patient's debility increased progressively; and the sputa resembled a greenish *purée* for the last six days of life. The auscultatory phenomena on the right side underwent no change. On the 27th, mucous rhonchus, mixed with gurgling, was audible under the right clavicle; posteriorly there was very strong bronchial respiration and rather marked resonance of the voice in the corresponding place. The last four days of life strongly marked sonorous rhonchus existed over the entire chest. The pulse became very frequent.

The anorexia became complete; nausea, and afterwards vomiting, occurred from time to time, and the tongue eventually grew dry. Abundant diarrhœa suddenly set in on the 10th, and he continued to have from fifteen to twenty stools every day till his death.

He lay in an almost constant state of stupor during the last four days of his existence, and expired on the 19th, at 7 p.m.

Sectio Cadaveris; *thirty-seven hours after death.*

External appearances. Slight œdema of the lower extremities.

Head. Close adhesions of the dura mater to the sagittal suture; slight sub-arachnoid serous infiltration; cortical substance of the brain slightly pinkish coloured; the medullary substances dotted with blood, and of good consistence. A tablespoonful of limpid serosity in each of the lateral ventricles; a little less in the lower occipital fossæ.

Neck. Epiglottis and larynx natural. Mucous membrane of the trachea red throughout, especially at its lower part; otherwise perfectly healthy.

Chest. Lungs generally adherent to the costal pleura by abundant cellular tissue; a portion at the apex of the right lung measuring two inches and four lines [6 centimeters] from above downwards, appeared transformed into a great number of cysts varying in size between that of a pea and of a large filbert. These seeming cysts, which were nothing more than dilated bronchi, contained a mucous reddish liquid, and a yellowish opaque matter, varying in thickness; they were placed in contact with each other, formed of a membrane as thin as the mucous coat of the colon, somewhat red, very firm and continuous

with that of the bronchi, which were elsewhere perfectly healthy. Some cysts presented valvular-looking folds. The same morbid condition existed at the apex of the left lung, but only implicated an inch and a half [4 centimeters] in width of the organ, and the dilatation of the bronchi was less marked there. There were neither tubercles nor tuberculous matter visible anywhere. The right lung was slightly engorged, and less yielding than the left, which was perfectly healthy, with the exception of the dilatation described.—Heart of small size; the aorta presented some yellowish slightly prominent patches throughout its entire length.

Abdomen. Upwards of five pints [about 3 litres] of clear serosity in the cavity of the abdomen.—Stomach of small size; mucous membrane grayish-coloured near the pylorus, dotted with red points elsewhere, attenuated in some places, very soft, except in the grayish-coloured place; so that it furnished strips only from one to two lines [2 to 4 millimeters] in length.—The small intestine was narrow, doubled in thickness, and very short; the mucous membrane as soft as mucus.—Mucous coat of the colon somewhat thickened throughout, extremely softened in the sigmoid flexure, elsewhere only slightly less consistent than in the natural state.—The liver adhered to the diaphragm; its tissue was perfectly healthy. The gall-bladder, no larger than a filbert, contained two blackish-coloured, soft, uneven concretions covered with mucus; its walls were upwards of half a line [1 millimeter] thick, which was in great part the result of thickening of the mucous membrane; the sub-mucous cellular tissue was very dense; the cystic duct in the natural state.

When I saw the patient on his admission, I believed him affected with some chronic disease of the abdomen, as also with phthisis of very slow type, which had only given rise to very limited anatomical change. The perfect sonorousness of the chest under the clavicles, made me, at first, hesitate in my opinion; but auscultation denoting the existence of excavations there, I supposed them produced by the softening of tubercles,—a notion apparently supported by the cough, the dyspnœa, the sputa, and above all, by the locality in which the excavations existed. I was deceived, and I should pro-

bably err similarly again, were a similar case to present itself to my observation. However, I may remark, that there was neither hemoptysis nor pain in the chest, nor had striated sputa been expectorated. The case justifies the conclusion, that circumscribed pectoriloquy at the apex of the lung, in a subject labouring under chronic pulmonary catarrh and who expectorates opaque, greenish, puriform, globular sputa, does not signify, with absolute certainty, the existence of phthisis; and that to the preceding circumstances must be added either hemoptysis, pain in the chest, or the signs of ulceration of the larynx and epiglottis, and dullness of sound.

No doubt, cases, such as that just related, are rare, and many years will probably elapse before I meet with another perfectly similar in character. It is not the less worthy of attention, however, as it is a proof of the difficulty of diagnosis in cases apparently the most simple.

However, the observer would incur the risk of falling into an opposite error from that now referred to, if—in cases where bronchial respiration and imperfect pectoriloquy exist at the apex of one of the lungs—he refused to recognize the existence of a tuberculous affection, unless dullness of sound under the clavicles were likewise present. For in cases where small cavities are surrounded with healthy or non-indurated pulmonary tissue, percussion is not obviously less clear than in the natural state, as would no doubt have been observed in the last case but one, had percussion been practised. We should then suspend our judgment under such circumstances, if, as I have just said, neither hemoptysis of any severity nor pleuritic pain had occurred in the course of the disease, or if there had been no symptoms of ulceration of the larynx or epiglottis or signs of chronic peritonitis,—morbid states involving the existence of tuberculous disease of the lungs.

It is to be borne in mind, too, that the alteration in sonorousness of the chest opposite large tuberculous cavities is not always of the same nature. Instead of producing a dull sound opposite them, percussion often furnishes a clear one, but of a perfectly different quality from that of the healthy state,—one which has something pathognomonic in it, leads, by graduation, to another modification known by the name of cracked-pot sound, which is rarely detected, except opposite large

cavities.[1] In these cases there is scarcely any apprehension of mistaking a simple dilatation of the bronchi for a cavity, inasmuch as such dilatation at the apex of the lung is never carried to a sufficiently great extent to give rise, in itself, to the modification of sound under consideration.

When existing elsewhere than at the apex of the lung, dilatation of the bronchi would be with difficulty mistaken for phthisis; for gurgling and pectoriloquy in a portion of the lung more or less distant from the apex, while the respiratory murmur presented no unusual characters in the latter position, would at once exclude the idea of tuberculous disease. The absence of hemoptysis, of pain in the chest, hectic fever, &c. &c., would effectually remove any possible doubt.

Independently of tracheal or cavernous respiration, which exists opposite tuberculous cavities, that modification of respiration, known under the name of amphoric, together with metallic tinkling, may also, as was remarked by the illustrious inventor of auscultation, be pretty frequently detected;—a phenomenon which, on first consideration, might lead the observer to suppose the lung perforated. But if the space, within which one or other of these phenomena is audible, be limited to the apex of the chest—the chosen seat of tuberculous cavities—error is scarcely possible. In other cases, when amphoric respiration and metallic tinkling are more extensively audible—when they

[1] The cracked-pot sound is not limited, as is generally believed, to tuberculous cavities of large size; it is also observed, although very rarely, under circumstances altogether different. Thus I ascertained its existence with Dr. Reynaud, twelve years since at the Hospital of La Pitié, in a man who died of pneumonia of the right lung; here this lung, of which the upper lobe was completely hepatized, contained neither tubercles nor purulent collection. I observed it a second time, in a medical student affected with pleurisy of the left side, which had produced effusion to a considerable amount; the entire side of the chest emitted a dull sound, while, very remarkably, the dullness was united with a cracked-pot sound under the clavicle. This student, who was not phthisical, recovered perfectly and rapidly. I think it well to add that percussion was practised in both cases, in such manner as to avoid an error which it may sometimes entail;—I mean that the finger, upon which the percussion was exercised, was placed parallel with and not at right angles with the ribs. When percussion is practised in the latter way, in truth, in emaciated subjects, the cracked-pot sound is easily produced, no matter what be the condition of the pulmonary parenchyma. And this circumstance is perfectly intelligible on Dr. Reynaud's theory; inasmuch as the air in the subjacent intercostal space is then driven more or less rapidly out from it by the act of percussion.

are discoverable from base to summit of the chest, as I have found them in cases wherein the greater part of one of the lungs was converted into a huge cavity,—in these cases, unless the formation of the cavity have been as it were followed step by step, a mistake may very readily be committed. And this more especially if the patient have experienced somewhere about the same time, and without obvious cause, a more or less marked fit of dyspnœa,—the most common symptom of invasion in cases of perforation. However, it is worthy of remark, that in the case in question when metallic tinkling and amphoric respiration are seated in a large cavity, the chest is less sonorous than under the contrary circumstances. With the progress of things, too, effusion of fluid takes place in cases of pneumothorax, which is not the fact when excavation of the lung is the morbid state present.

The reader has not forgotten that it is especially during the second period of phthisis that the development of ulcerations takes place in the larynx and epiglottis. The presence of either laryngeal or epiglottic ulcerations adds materially, in certain cases, to the certainty of the diagnosis, as has been already seen in connexion with the preceding case. The same may be said of chronic meningitis and peritonitis, although they are of much more utility, in the matter under consideration, during the first than the second period of the disease.

CHAPTER IV.

TERMINATION AND PROGNOSIS OF PHTHISIS.

Phthisis almost invariably terminates fatally, after a space of time varying between a few weeks and several years. In some rare cases the disease appears to tend to a fortunate issue; and here the patients, after having experienced the most severe symptoms of the affection, retain scarcely even those of slight chronic pulmonary catarrh, and are not prevented from following their occupations and fulfilling all the duties of social life. For instance, I lately saw at the Hospital Beaujon, a man aged forty-five, who fourteen years before his admission had experienced symptoms of most serious character, and to all appearance dependent upon pulmonary tubercles. Attacks of hemoptysis, very copious expectoration, diarrhœa and rapid emaciation had taken place; the patient kept his bed for six months, after which his health was gradually reestablished, and he was enabled to undertake very hard work, at which he had continued uninterruptedly until he fell under my observation. He then coughed a little, was tolerably full in person, and almost free from fever; his chest was well shaped, presented no depression under the clavicles, emitted a somewhat dull sound under the right, over a surface measuring two inches and four lines [6 centimeters] from above downwards. Here, too, the respiration was bronchial, accompanied with some crackling sounds, and there was marked bronchophony. The results of auscultation and percussion were the same in the corresponding region posteriorly; whereas, all was natural on the left. The patient had in a few days completely recovered from the ailment which brought him to the hospital; he nevertheless remained there two months, during which the sole perceptible change in the phenomena mentioned was a slight diminution

in the bronchophony, under the right clavicle.—Some months later this patient again came to the hospital, with some symptoms of capillary bronchitis at the base of the lungs; and I satisfied myself that auscultation and percussion gave the same results under the right clavicle, as on his first admission.

Twelve years ago I saw at the Hospital of La Pitié a man of vigorous frame, with a broad deep chest, aged fifty, who was admitted for some very trifling ailment. He coughed a little habitually for the last fifteen years, and kept his bed on the first invasion of the cough for some weeks; after this he enjoyed perfect health, with the exception of slight cough, and resumed without subsequent interruption his usual laborious occupation. The chest emitted a somewhat dull sound under the right clavicle, where I detected cavernous respiration and perfect pectoriloquy. There was no rhonchus.

I attended, for a period of nearly eight years, a person of high rank in the state and of large hereditary fortune, of strong and even robust constitution, broad shouldered, broad and deep chested, subject to no derangement of digestion, and exceedingly temperate in his habits. During the eight years in question I was consulted for trifling attacks of acute pulmonary catarrh, accompanied with slight sub-crepitant rhonchus at the base of both lungs, posteriorly,—attacks scarcely attended with any fever, and lasting a few days only. Between these attacks the patient expectorated several times in the day, as he had been in the habit of doing for a number of years, a large, greenish sputum, free from air, and which stood out from the surface on which it fell. In spite of this, however, he was so strong and energetic, and bore bodily fatigue so well, that it seemed next to impossible to imagine him for a moment affected with organic disease of any importance, and I never thought of examining the upper part of his chest. When I was first called to attend him, he had had several attacks, some of them of extremely severe character, of nephritic colic. He died of a painful affection of the urinary passages; and at the examination of the body I found at the apex of the right lung a cavity somewhat more than two inches [5 centimeters] broad, lined with a pseudo-membrane, communicating with the bronchi, and close to its periphery two tubercles, of the size of a very small hazel-nut, beginning to soften.

Can the first of the three cases, now related in outline, be regarded as an instance of cure of tubercles? And if we admit that it was so, is the cure to be considered temporary or permanent? If we take into consideration that the tendency to tubercles decreases with the advance of life, that the older individuals grow, the less are they exposed to the chance of their formation, we shall feel disposed to believe that the patient in question may still continue subject to colds, but that he will not be the subject of deposition of fresh crops of tubercles. The same may be said of the patient observed at La Pitié, and might, at a certain period of his life, have been affirmed of the last patient also,—in whose body two tubercles, the only ones in the lungs, were found in the neighbourhood of a cavity. For when these two tubercles had softened completely and given place to small cavities, the patient's state would not have become obviously more dangerous, nor his life been materially shortened thereby. However, it must be borne in mind, that all this, though supported by many probabilities, is far from being matter of certainty.

It is further worthy of remark, that the three patients in question had all passed their fortieth year,—that one only of their lungs had been, or appeared to have been, tuberculous—that in the last two cases the cavities had, to all appearance, retained their original dimensions,—that these patients belonged to different classes of society,—that the invasion of the disease was in one case marked by severe symptoms, which was not the fact in the others,—and that in no single one of them could the fortunate course of the disease be ascribed to any system of treatment.

I might collate with these three cases some of those referred to in the chapter devoted to the subject of the Course of the Disease. And were it possible to take into consideration all similar cases observed in the practice of a certain number of physicians, well entitled to form an opinion on the point, we should, I make no manner of doubt, discover a much greater number of such cases than would be commonly supposed, and all of them individually proving beyond all question that phthisis may stop short in its progress. But many of these cases pass unperceived, and not a few practitioners doubt for this reason the compatibility of tuberculous disease and continued life. Nevertheless, the anatomical researches of Laennec and his successors on the

curability of phthisis, leave no doubt upon the point. Among the most recent and most interesting of these the investigations of Dr. Rogée, published in the 'Archives de Médecine,' and referred to by Dr. Valleix, hold a very prominent place. It results, in truth, from the inquiries of Dr. Rogée (whom premature death has removed from the scientific pursuits, which he had undertaken with sound discretion), that the cretaceous or calcareous concretions sometimes formed at the apex of the lungs, are always the sequence of cured or transformed tubercles. Now one half of the women opened without selection and carefully examined by him at the Salpétrière, presented one or more of these concretions at the apex of the lungs; that is to say, that one half of them (fifty-one out of one hundred) had at a certain period of their lives laboured under phthisis of very limited extent.

These facts are assuredly possessed of immense interest; for were they confirmed by others of the same kind, and in greater number, the necessary conclusion would be, that phthisis is still more frequent than is generally supposed, and above all, that it stops short in its course much oftener than has hitherto been imagined.

It is however difficult to believe that the symptoms dependent on the tubercles, of which Dr. Rogée discovered these traces, could ever have been of a very serious kind; or that the little cretaceous masses described could have succeeded to large cavities. It is more probable that, in the cases in question, the disease always followed a slow, inactive course; and it becomes a question whether in such cases of phthisis, when the anatomical change is so limited in extent, the disease commenced in youth or in advanced age. It also becomes a question whether we are entitled to affirm that an attack of hemoptysis at all severe, not followed by the symptoms of phthisis (which is unfortunately very rare), whether such hemoptysis, I say, could be considered as essential, when the morbid state upon which it almost constantly depends may be extremely trifling in amount and remain latent.

The study of phthisis under the present point of view—that of its curability—has as yet made but very little progress, and consequently does not at the present day possess all the interest which ought to belong to a subject of such great importance. In the cases of cure, hitherto known, the morbid state has always

been very limited in extent, and this limitation has not been the result of any circumstance which, although fortuitous, was still appreciable, and hence, more or less easily producible at will in other cases,—but the effect no doubt of circumstances peculiar to each individual case. The nature of these circumstances is at the present hour utterly unknown, and to the steady investigation of them medical observers should henceforth sedulously apply themselves.

It appears, too, from all that precedes, how difficult a matter it is to form a prognosis in phthisis, and into what an abundance of errors we should be drawn, were we to endeavour to establish it on the invasion of the affection. On the one hand, a certain amount of severity in the symptoms at the outset does not always prevent the disease from stopping short in its course. On the other hand, we have seen that the affection, after having advanced for a certain number of years with much, nay, extreme slowness—perhaps even after having stopped completely for a season—may suddenly assume all the characters of severity, and cut off its victim in a very short space of time. Perforation of the lung may take place very soon after the invasion of the malady; tubercles may form in the meninges; or chronic inflammation seize on the peritoneum. It is impossible, in the present state of knowledge, to foresee the time at which these symptoms will manifest themselves in individuals destined to experience them, or to prognosticate who will be afflicted with, and who exempt, from their development. Here are reasons in abundance to prove the wisdom of caution in prognosis;—while at the same time their general tendency is to display the danger of the affection, and the small hope of prolonging existence, when the symptoms assume a severe character at, or soon after, the period of invasion.

CHAPTER V.

ETIOLOGY.

We have now reached the most important point in the history of phthisis, though, unfortunately, at the same time that which has hitherto been most imperfectly studied. Not assuredly that there is any penury of assertions as to the causes which predispose to, or determine the actual development of, the disease;—but that facts accurately established, facts of such stamp as to qualify them for taking part in advancing the limits of knowledge, are wanting, in regard of almost every question that may be started. And in the small number of conclusions which I shall be enabled to derive from those I have myself collected, I shall rather find materials for combating error than establishing truth.

I shall commence—following the natural order of things—by the consideration of such facts as bear upon the class of causes called predisposing; I shall then undertake that of the exciting causes.

SECTION I.—PREDISPOSING OR REMOTE CAUSES.

§ 1. *Age.*

Age is incontestably one of the circumstances most powerfully influencing the development of tubercles. The examples of phthisis in the fœtus, on record, are few in number; and, according to Billard [1] and M. Baron, tubercles are rare during the first months of extra-uterine life. M. Guyot, according to the statement of M. Papavoine, opened four hundred new-born infants, without meeting with a single example of the kind. [2]

[1] Traité des Maladies des Enfans. Paris, 1837. p. 735.

[2] Mémoire sur les tubercles; Journal des Progrès. t. xx, p. 101.

According to the latter observer, it is at the period of the first dentition, more especially when accompanied with some morbid condition, that tubercles appear in the various organs; and nevertheless, he adds, they are far from being as frequent during the first two years of life, as those immediately following. According to M. Lombard, of Geneva, tubercles are most frequent from the age of four to five years; and of nine hundred and twenty children, aged from two to fifteen years—three hundred and eighty-eight of them boys, and five hundred and thirty-two girls—opened by M. Papavoine, three hundred and twenty-eight, or nearly the three fifths, presented tubercles. And in these five hundred and thirty-two cases tubercles were, if not the sole cause, the immediate cause of death in three hundred and twenty-seven, that is to say, in more than one third of the whole number. In the two hundred and eleven others the tubercles constituted a secondary alteration only.

The following table, drawn up by M. Papavoine, shows the numerous variations in the frequency of tubercles according to age.

Of 709 Children, Females and Males.

Aged	Number tuberculous.	Number not tuberculous.	Ratio of the first to the second.	Ratio of tubercles at each age to their mortality.
2 or less - -	73	110	7 to 11	$\frac{1}{5}$ and about $\frac{1}{2}$
3 - - - -	64	64	1 - 1	$\frac{1}{6}$
4 - - - -	46	24	2 - 1	$\frac{1}{9}$
5 - - - -	35	13	$2\frac{2}{3}$ - 1	$\frac{1}{12}$
6 - - - -	32	14	$2\frac{1}{4}$ - 1	$\frac{1}{13}$
7 - - - -	29	10	3 - 1	$\frac{1}{14}$
8 - - - -	24	14	$1\frac{5}{7}$ - 1	$\frac{1}{17}$
9 - - - -	16	8	2 - 1	$\frac{1}{25}$
10 - - - -	18	13	$1\frac{1}{2}$ - 1	$\frac{1}{23}$
11 - - - -	12	8	$1\frac{1}{2}$ - 1	$\frac{1}{34}$
12 - - - -	24	8	3 - 1	$\frac{1}{16}$
13 - - - -	10	5	2 - 1	$\frac{1}{41}$
14 - - - -	18	10	1 - 1	$\frac{1}{41}$
Age not noted	14	0	- -	$\frac{1}{29}$
Totals	408	301		

That is to say, that from the fourth to the thirteenth year

the number of children affected with tubercles appears to be invariably greater than that of those free from them; and that the frequency of tubercles is more especially great between the ages of four and seven years.

It has also been seen, in a previous part of this work, that the proportional frequency of tubercles varies greatly at different ages. But, considering in a general manner the total mass of tuberculous individuals aged either less or more than fifteen years, the proportional frequency is found to differ less than would on first thought have been anticipated, inasmuch as it follows from my own investigations at the Hospital of La Charité, that about two fifths of the patients who die in that hospital are tuberculous.

§ 2. *Sex.*

The records of medicine contain, unless I deceive myself much, very few documents indeed capable of rigorously demonstrating the relative amount of tendency in the two sexes to phthisis. Bayle, who threw such strong light on the history of the disease, confines himself to the statement that it destroys about the same amount of individuals belonging to each sex. The facts I have myself collected do not support this notion. In truth, of the one hundred and twenty-three cases analysed in the first edition of this work, and collected in wards containing forty-eight beds, equally divided between individuals of both sexes, seventy were furnished by females, and fifty-seven by males,—a fact which of itself alone leads to the idea that women are somewhat more subject than men to phthisis. This fact harmonizes perfectly with another established by myself,—namely, that out of an equal number of males and females admitted into the same wards, and cut off by chronic diseases of different kinds, there were forty tuberculous, and of these forty fifteen were men and twenty-five women.—Uniting the numbers belonging to these two series of cases we shall find the number of phthisical men to be seventy-two, while that of women was ninety-two,—a difference rather material in amount, and which at least renders it presumable, notwithstanding the smallness of the number of cases analysed, that phthisis is more frequent in females than males.

M. Benoiston de Chateauneuf has been led to analogous results by the examination of facts of another order.[1] He found that of 43,010 patients admitted between 1821 and 1836 into three of the Paris hospitals, 1554 died of phthisis; 754 of 26,055 men, and 809 of 16,955 women,—that is to say, that during the period in question 1-35th of the males died of phthisis and 1-21st of the females. And though we admit that the hospital registers are not kept, in respect of the point under consideration, with all the accuracy desirable, still we cannot conclude therefrom that the result obtained is of little value, inasmuch as the errors which may have been committed, being the same in both sexes, compensate each other, and cannot materially affect the general correctness of that result.

It seems then difficult to question the fact that in France at least, and more particularly at Paris, phthisis is considerably more frequent in females than in males.

Again, it results from a table drawn up by M. Papavoine, and inserted in the essay already referred to, that of 532 little girls, of from two to fifteen years of age, opened by him at the Children's Hospital, 308, or 3-5ths, were tuberculous; and that of 387 boys opened at the same hospital 210 only, or about 2-3ds, were similarly affected. Here is an important fact, and one apparently justifying the conclusion—for the facts analysed are tolerably numerous—that phthisis is more common in the female than the male sex, at all periods of life, at least in France, and at Paris more particularly.[2]

When engaged with the subject of the influence of temperaments, I shall point out the circumstance upon which this remarkable difference depends.

Allowing that the number of cases analysed, although considerable, is not sufficiently so to justify us in considering the inferences deducible from them matter of established law, it will be granted for the same reason that these results cannot be considered to be weakened by doubts of an opposite kind, drawn from a still smaller number of cases. Thus, Dr. Home (in his Report relative to the Royal Infirmary of Edinburgh,

[1] Annales d'Hygiène publique et de Médecine légale. t. vi, p. 5.

[2] [The calculations in this paragraph are obviously erroneous. Admitting the quantities 532, 308, 387, and 210 to be correct, it follows that of girls 56·01 per cent., and of boys 54·26 per cent., were tuberculous.—Tr.]

for the years 1833, 1834, 1836),[1] relates that of 297 phthisica subjects who had died in, or who were still inmates of that institution, 185 were males and 112 only females; although the number of the latter sex admitted for diseases of all kinds during the period in question was much more considerable than that of the former. Assuredly, no conclusion can be drawn from this result in opposition to those which precede. And if similar results were deducible from facts in greater number, and obtained under various conditions in Great Britain, we should first ascertain whether the social state of women of the labouring classes in France and that country are not sufficiently different to entail a necessary difference in the proportions in which they fall victims in the two countries to fatal diseases.

§ 3. *Constitution.*

Delicacy and weakness of constitution have long been esteemed strong predispositions to phthisis; and what we have just read regarding the influence of sex appears favorable to the prevailing opinion. Still there is just ground for questioning the accuracy of this opinion in the analysis of the cases related in connexion with the subject of the course of the disease,—an analysis showing that phthisis passed through its periods as rapidly in strong as in weak individuals, nay, even more quickly in the former than in the latter.

The doubt here expressed will perhaps appear far from reasonable to a considerable number of practitioners; still I have the less hesitation in promulgating it, as I had hitherto myself shared the common opinion, and hoped that the study of facts would confirm it. I feel it then to be my bounden duty to declare this doubt; more especially, because the general doctrine, which, as I say, I myself followed, is not based upon any accurate, I had almost said, serious investigations. Let it not be forgotten that I speak only of doubt, and that I have not the remotest intention of attempting to set aside one assertion by another, founded too upon a number of cases, I readily admit, as yet too small. And reserve is the more necessary as the doubt in question is founded upon analogical reasoning;

[1] Gazette Médicale de Paris, 1838, p. 72.

and as we cannot rigorously infer from the fact of a disease advancing less rapidly in weak than in strong persons, that it is less common in the former than in the latter.

It is obvious that in order to ascertain accurately the influence of strength or weakness of constitution on the frequency of phthisis, we should, first of all, be acquainted with the proportion of weak to strong constitutions in the working classes of Paris, upon whom my researches have been principally made.

The investigations required for this purpose would, if I mistake not, be neither very tedious nor difficult. To attain the end in view, it would suffice to take a census of the population of all the hospitals in Paris, limiting the statement of particulars in the case of each individual to an accurate enumeration of previous diseases suffered under, of the state of vigour or weakness of the frame, with the peculiarities of temperament, without entering into much detail on the subject of the existing malady, whatever it might be. If the same results were arrived at in two successive years, and the proportional numbers of weak, strong, and medium constitutions found the same, we should be warranted in considering these results accurate and true. And thenceforth a fixed standard would exist as a starting point for the study of the influence of strong or weak constitutions on the development of all morbid affections.

§ 4. *Temperament.*

The influence of temperament on the development of phthisis is perhaps not much better known than that of strength or weakness of constitution. Nevertheless an important fact has been established by M. Papavoine in the essay already quoted, namely, that the lymphatic temperament which, after the age of fifteen, is incontestably more frequent in females than males, is also more common in girls than boys.[1] And as, on the other hand, it results, from the facts collected by

[1] Of 212 Girls aged from 2 to 15, 46, less than $\frac{1}{4}$, were dark.
95, near $\frac{1}{2}$, were fair.
91 had chesnut-coloured hair, &c.
Of 86 Boys of the same age, 28, or $\frac{1}{3}$ were dark.
20 were fair.
38 had chesnut-coloured hair, &c.

the same observer, from my own cases, and from the analyses of M. Benoiston de Chateauneuf, that phthisis is more frequent at all ages, in females than males, it becomes a matter of extreme probability, that the lymphatic temperament constitutes a more or less marked predisposition to the development of phthisis, at least in France, and more particularly at Paris.

§ 5. *Rachitis.*

Rachitis, which is, according to the common opinion, the last degree of the lymphatic temperament, ought, in conformity with what has first been said, to act as a powerful cause of tuberculization. Nevertheless, of eighteen rachitic children M. Papavoine (loc. cit.) found only three tuberculous; and of ten adults who laboured under more or less obvious symptoms of rachitis, M. de Castelneau discovered one only in whom any traces of tubercles existed. The subjects in question were females, all of them observed at the Hospital Beaujon and nearly at the same time. One only of them was young; she was aged twenty-seven, and was not tuberculous; the youngest of the remaining subjects was sixty-five years old, and the oldest seventy-six.

These facts—which, on account of their small number, and the age of the individuals to whom they refer, really prove nothing—show, at least, that rachitism is not unfrequently compatible with length of life, and they warrant doubts as to the influence ascribed to rachitism on the development of tubercles.

§ 6. *Hereditary influence.*

The tenth part of the subjects who fell under my observation were born of parents, either father or mother, who, according to all appearances, had died of phthisis. But as this disease might have been transmitted in these cases, or have been developed independently of such influence, and as I knew nothing of the manner of death of the brothers and sisters of these patients, it follows in reality that I have observed nothing decisive in favour of the hereditary character of phthisis. I may remark that the proportion of phthisical patients born of parents who died tuberculous, is

probably below the truth in my notes; inasmuch as it is far from being always possible to ascertain from hospital patients the nature of the affection to which their parents fell victims. But it is obvious that in order to substantiate the exact amount of hereditary influence, it would be necessary to draw up tables of mortality, by means of which we should have the power of comparing an equal number of subjects born of parents who were phthisical and who were not so.

M. Briquet, in an interesting essay recently published on the Etiology of Phthisis (in which he ascribes to me an opinion on the question before us somewhat different from that actually contained in the first edition of this work—an opinion which I have now reproduced),—M. Briquet, I say, states with the view of demonstrating the reality of hereditary influence on the development of phthisis:—First, that of 67 male phthisical patients who fell under his observation, 37 were born of healthy or non-tuberculous parents,—24 of phthisical parents,—6 of parents, the condition of whose health it was found impossible to ascertain satisfactorily; secondly, that of 32 phthisical females, 14 were born of non-tuberculous parents,—12 of phthisical parents,—5 of parents whose state of health could not be learned.[1]

But, as has very recently been remarked by one of the editors of the 'Archives de Médecine,' if the mortality produced by phthisis at the Necker Hospital (to which M. Briquet is physician) during the space of three years averaged 11-37ths, or somewhat less than one third of the whole mortality; this would signify that 11-37ths of the population of Paris die phthisical, and that, consequently, whenever we proceed to the investigation of hereditary influence in respect of any disease, we must find tuberculous parents eleven times out of thirty-seven. So that if this same ratio existed in the instance of the *parents of tuberculous subjects*, hereditary influence would be shown not to exist at all.[2] It is besides obvious, from this, that the facts collected by M. Briquet do not prove all that they appear to do on first view.

I have, besides, much difficulty in believing, in spite of his good faith and sagacity, that the author has not been led into

[1] Recherches Statistiques sur l'Histoire de la Phthisie (Revue Médicale, Fevrier, 1842).

[2] Archives gén. de Méd. 3ème série, t. xv, p. 216.

error. It results, in truth, from the analysis given by M. Briquet of his collected cases, that almost all the patients whom he interrogated on the matter, were able to give him accurate information on the state of health of their parents, or on the disease of which they died, when that event had taken place before the patients' admission into hospital. Of 109 patients, 98 were able to afford this information; and, if we cut off from the number 3 foundlings, it will follow that of 106 patients, 98 (the entire number with the exception of 8) were able to give a trustworthy account of the health of their father and mother. Now I must frankly own, that I can with difficulty admit this; for, for my own part, I have never been able to succeed, no matter with what attention I examined patients in hospitals, in discovering so large a proportion well acquainted with the lot of their parents. Last year, even, desiring to collect some additional data respecting hereditary influence in phthisis, I examined 104 patients with extreme care; and, of these, 55 only were capable of giving trustworthy information on the health of their parents. I did not, it is true, regard the mere statement on the part of patients, that their father and mother had died of this or that disease, as sufficient to establish the real character of the disease. I did not consider the existence of any given affection demonstrated, unless the patients were able to distinctly indicate such few characteristic symptoms as, combined with their knowledge of the duration of the disease, place its nature beyond question, and assign it its place in the nosology. Proceeding in this manner, I found that of 31 phthisical patients (among the 104 interrogated), 3 sprang from parents who were obviously phthisical; 12 from parents who were not phthisical, some of them dead, others still living; and 16 from parents the nature of whose disease could not be determined with precision. Very probably M. Briquet did not consider it necessary to obtain such full information from patients; he may, perhaps, have considered the fact of prolonged illness, accompanied with great emaciation in any case, sufficient to prove the individual phthisical; or, perhaps, he may sometimes have been satisfied with the mere name of the disease. It is conceivable that, following plans of investigation so different, two observers, though possessed of equal good faith and desire to ascertain the truth, should arrive at very different results.

The reader will, no doubt, pardon this digression; my motive

for indulging in it was to show what real difficulty attends the determination of questions which are in appearance the very simplest,—to display the serious difficulty of observation, and the time and care it requires, in order to give a positive character to the results it furnishes.

The question of the influence of hereditary transmission on phthisis, involves too, as is well known, many subsidiary inquiries. For example: whether hereditary influence is more active in this than in other chronic maladies;—whether tuberculous disease is more readily transmitted by the father or the mother, &c. &c. Such questions are full of interest; they are examined by M. Briquet, as will be found by reference to his Essay.

§ 7.

Catamenial irregularities, which disturb and weaken the system; respiration of impure air; habitation of confined places, into which the light of the sun scarcely penetrates, and in which the air is imperfectly renewed; a life of seclusion; privation of sleep, and a life of anxiety; the depressing passions; abuse of fermented liquors; habitual indigestion; food of bad quality, &c. &c.—all these circumstances, so many sins against hygienic laws, are considered by authors as predisposing causes of phthisis.

Assuredly no one will deny that forgetfulness of all hygienic laws entails, or may more or less promptly entail, a complete perturbation of the system, and predispose individuals to a great number of acute or chronic affections, and to phthisis among many others. It does not require any very exalted effort of the reasoning faculty to admit a proposition of the kind; the question with which we have to do is a different one. This question is, whether forgetfulness of hygienic laws, and more especially bad nourishment—upon which Sir James Clark and the late Dr. T. J. Todd have, no doubt with excellent reason, emphatically dwelt,—whether, I say, these conditions predispose more to phthisis than to any other chronic disease. Now the able persons who have treated this question, do not appear to me to have attained the object they had in view. The simple relation of a few cases, or even of a great number of cases of phthisis, in which the disease was developed under the most unfavorable hygienic conditions, does not, in truth, suffice to prove the in-

fluence of bad diet and infringement of hygienic laws upon its production; for we might, here, have mere coincidences, likely to occur in connexion with all kinds of disease. Nor would it even suffice for the attainment of this object to show (as M. Lombard appears to me to have very satisfactorily done in respect of the Canton of Geneva), that the development of phthisis is favoured by physical misery. It is really necessary, in order to ascertain the *special* influence of misery, and of the other conditions in question on the generation of phthisis, to compare all chronic affections with each other, and to inquire—all other things being equal in respect of original constitution, strength, weakness, age, sex, &c. &c.—whether any one of these affections originates more frequently under the influence of infringement of hygienic laws than under the opposite circumstances. It is obvious, that until numerous facts have been collected comprehending all the conditions which precede the development of chronic diseases and may predispose to them, any statements made upon the subject can be nothing more than so many assertions without proof to support them. And it is not among the least of the evils attending the dissemination of such assertions, that they habituate the physician to content himself with vague notions, and to admit heedlessly various propositions which are supported only by a little more or a little less probability. What can be more obvious than that the first step towards the real and not the fancied knowledge of the remote causes of phthisis (and in particular the true influence of those in question) must be to ascertain whether the same causes would not entail the development of any other equally chronic disease?

Many persons have, no doubt, made the same reflections, and nevertheless I have not thought it right to suppress the expression of them here, because the study of the etiology of diseases is generally undertaken with great levity, even by men of high acquirement. In truth, one would imagine, judging from the manner in which the subject is generally handled, that some slight general knowledge, supported by a little more or a little less common sense, is quite sufficient to fit its possessor for the discovery of the causes of disease, even of those of the chronic class;—in other words, to qualify him for the solution of the most complicated problem within the whole range of pathology.

Although it be impossible to refuse to admit, *à priori*, the

ill influence of bad food on the development of chronic diseases generally, those of phthisis among the rest in particular, I was desirous of ascertaining (and it were to be wished that a greater number of facts were submitted to examination in this point of view) whether such influence were discernible in the mode of progress of the affection, or its more or less rapid evolution: the result at which I arrived afforded me no small surprise. Of thirty phthisical patients, carefully examined in respect of this matter, twelve had been badly nourished in infancy, and had frequently been in want of the necessaries of life subsequently; now in these patients the development of phthisis took place between the fifteenth and the fiftieth years, on an average at the age of thirty-one,—eight of the number were aged under thirty at the outset of the affection. On the other hand, eighteen had been always well fed from infancy, and had never suffered from privation of any kind; in these persons the tuberculous disease commenced on an average at the age of thirty years and ten months,—in other words, at almost identically the same period of life as in the patients who had always lived in misery. Of the latter eighteen patients, eleven had not reached the mean age of the whole number, when the first symptoms of phthisis supervened. Hence these two series of subjects presented no appreciable difference in regard of the point under consideration, and if well observed facts in greater number should lead to the same result, the influence of misery on the generation of phthisical disease would be rendered, to say the least, problematical. For it is difficult to understand how a certain influence, which is in action from infancy, could fail to hasten the outbreak of a disease of which—according to the postulate—it increases the frequency.

It is unquestionably not impossible that, in the persons referred to, certain circumstances may have existed to counterbalance the effects of defective nourishment. But to enable us to examine the facts under this point of view, and arrive at results of any value, their number should be greatly increased, the influence of strength or weakness of constitution, that of trade, &c. &c., should be studied,—a task of enormous magnitude, and one which, as we shall presently see, is unfortunately not very far advanced.

§ 8. *Trade and Occupation.*

The influence of professions and trades on the development of phthisis is assuredly one of the most complicated and difficult problems which the pathologist can propose to himself to solve; and in the actual state of things, and with the materials now within his reach, the problem appears to me to be unsusceptible of solution. The researches of M. Benoiston de Chateauneuf, and those published subsequently by M. Lombard of Geneva,[1] are far from being devoid of interest; and all who follow these inquirers, in the search after the same object, must of necessity consult them. But these learned persons were not possessed of all the data of the problem to be solved; and the results at which they arrived cannot, were it for this reason alone, be considered as otherwise than provisional. The truth is, that it is necessary to take a multitude of circumstances into consideration, in the attempt to determine the influence of professions on the development of the disease,—circumstances so important that, without them, the closest analysis of cases could not lead to other than erroneous conclusions. The artisan does not live only in a dry or moist, cold or hot atmosphere; he does not breathe only inoffensive or deleterious vapours; he does not follow only a sedentary or active trade, &c.; his trade further requires a great outlay of strength, and a vigorous constitution, or those who pursue it are weakly, and constitutions of this stamp suffice for its duties: again, the wages of the artisan allow him, or do not allow him, to procure good food, and a healthful lodging, &c. &c. All these circumstances, with a number of others, the signification of which, in respect of the subject before us is unknown—though they may possibly be of great importance,—these circumstances have not been and could not be appreciated by the authors just named; and for this reason the result of their labours cannot be esteemed, as I have already said, otherwise than provisionally established.

It is also to be observed that M. Lombard has, in his very important Essay, frequently combined on purely artificial principles, classes of facts, differing in so many particulars that they should have been widely separated. Thus, among the occupa-

[1] Annales d'Hygiène publique et de Médecine légale, t. xi, p. 5.

tions requiring active exertion, he has placed that of the stock-broker between the groom and the public-house keeper; among those requiring much exercise of the vocal organs, he places those of the barrister and the military officer beside each other; among those requiring persons who follow them to sit in a bent position, we find the shoemaker, the tailor, and the watch-maker, &c. Such arrangements of facts as these are obviously not natural, and cannot be admitted; and M. Lombard, probably, made them, only because the numbers upon which he had to work, though large when combined, were too small for each trade in particular. But they must necessarily have had some influence on the results obtained by the author,—an additional reason for regarding these results as merely provisional. Let us then accumulate materials in imitation of the Canton of Geneva, but abstain from inferences, till they are sufficiently abundant.

§ 9. *Influence of clothing.*

The alleged influence of clothing of different kinds, and in particular that of stays, on phthisis, is perhaps nothing more than matter of assertion, wholly unsupported by proof. Many of the females who fell under my observation had no doubt been short-breathed long before they became phthisical; but the number of men similarly situated was not less considerable. Hence, were we to admit a connexion between this state and the development of phthisis, we should not be warranted, in cases where women, laboring under phthisis, had worn stays from their earliest youth, to ascribe the disease to the influence of that article of dress. Besides, the majority of my patients had been brought up in the country, had worked in the fields, and had not used stays until they came to Paris, at an age when they had attained their full development, and when, consequently, the influence of stays on the dimensions of the chest cannot be very material. Supposing for a moment, however, that such influence does really exist, it is clear how difficult it would be to demonstrate the proposition. Such demonstration would in truth involve the necessity of comparing two large series of women placed, in every respect, in the same conditions, except that the individuals in one of them commenced to wear stays at a very early period, in the other not till they had ceased to grow;

and ascertain if the proportion of cases of phthisis furnished by the one were greater than that by the other. The influence of stays on phthisis, and generally speaking that of all things and conditions which interfere with the development of the body, is the more doubtful, as tuberculous disease is about as frequent in subjects of strong as of weak constitution, and is more frequent in females than in males at all periods of life, and as well before as after the age of fifteen, that is before as after stays have usually been worn. Let me insist upon the importance of abstaining from assertions, without positive proof to uphold them, and above all, of not trusting to analogical inferences.

§ 10. *Climate and temperature.*

Climate, and more especially temperature, have been, until lately, regarded as conditions possessed of the greatest power in either exciting or warding off the development of tubercles; in such manner that warm countries, those generally of high temperature—the south of Europe in particular—were generally considered to be exempt from phthisis. Unfortunately, this is not the truth; modern observers have shown by statistical evidence that phthisis is prevalent in all countries, the hottest as the coldest. Dr. Journée's tables leave no doubt upon this point, as regards the chief towns of Italy;[1] and they show, also, that tubercles are, or appear to be, as frequent in those large masses of population as in the heart of France, at Paris for example. At the present day the entire, or very nearly the entire, profession is agreed upon this matter.

However, while they find themselves forced to recognize the existence of facts so thoroughly well established, many medical practitioners still imagine that, although a high or low temperature will not on the one hand preserve from tubercles, nor on the other excite their development, abrupt variations of temperature must produce the latter effect, and *per contra* almost constant uniformity of temperature, or the absence of abrupt transitions from heat to cold, must shield individuals more or less completely from tuberculous disease. Unfortunately this notion is, as far as all appearances entitle us to judge, nothing

[1] Bulletin de l'Acad. Royale de Médecine, t. iii, p. 542. Paris, 1839.

more than an additional delusion. At least, that it is so is rendered more than probable by the statistical tables drawn up by order of the British government, relative to the health of the troops in occupation of the possessions of Great Britain in the various parts of the globe.[1]

In every one of these possessions, in truth, diseases of the chest, acute or chronic, are very frequent, although to somewhat different amounts. If they be common in Canada and Nova Scotia, they are so also in the Mediterranean, at Gibraltar, Malta, the Ionian islands, the Antilles, the Bermudas, and Jamaica,—countries in which the mean temperature and the common variations of temperature differ so widely. Thus, of 61,066 soldiers observed in Canada during the space of twenty years, 402 were phthisical, or 6·5 per 1000 annually. The proportion was the same at Gibraltar, out of an equal mass of soldiers, observed during the space of nineteen years. Out of 11,721 observed in the Bermudas, during a period of twenty years, 103 were phthisical, or 8·8 per 1000; and yet the climate of those islands is mild and *equable*, while that of Canada is excessively cold, and exposed to great and sudden variations of temperature.

What is true of Gibraltar and the Bermudas is so of Malta also; yet here the variations of the thermometer are inconsiderable, the temperature high, the soldier well fed, and not fatigued by duty. At Malta, in truth, the yearly proportion of phthisical patients is 6·1 per 1000; whereas it is 6·4 in the cavalry on home stations in Great Britain. The proportion of phthisical subjects is somewhat less among civilians at Malta, among whom it is calculated at $5\frac{1}{8}$th; here is a difference, again, far from being favorable to the common creed, that removal from a cold to a warm country is capable of retarding or putting a stop to the progress of tuberculous disease.

In the Ionian islands, exposed as they are to sudden and great variations of temperature, and to extremes of cold and heat, the mortality of the British army from phthisis is not greater than at Malta. But it is much greater than in Jamaica (13 per 1000 annually), where the thermometer is subject to

[1] Rapports statistiques sur les Maladies de l'Armée Anglaise, dans les Antilles, &c. &c. avec une préface du capitaine Al. Tulloch.

similar sudden and great variations. How shall we account for these differences of proportion in countries which resemble each other as much in respect of temperature as of sudden atmospheric changes?

It is further, very remarkable that, in these same British colonies, the proportion of acute affections of the chest does not vary as the temperature,—in other words is not so much the more considerable (very far indeed from this, on the contrary), the lower the temperature and the greater the variations of the thermometer within one and the same day. The following table, by the author of the work from which I have derived the preceding facts, exemplifies the truth of this statement:

Colonies.	Total of the troops.	Total cases. Pneumonia and Pleurisy.	Annual proportion per 1000.
Gibraltar - - - - -	60,269	2543	42
Malta - - - - -	40,826	1391	34
Ionian Islands - - -	70,293	2272	32
Bermudas - - - -	11,721	441	37
New Brunswick - - -	44,121	1577	35

No doubt the accuracy of the facts, upon which these statistical results are founded, may to a certain point be made matter of contestation. But errors in diagnosis, which I find no difficulty in admitting must have occurred, did not take place in any single one only of the British colonies; they must have occurred in all, and in about the same proportions; hence the results are strictly comparable. It follows then, from the evidence now brought forward, that the prevailing opinion respecting the influence of climate on the development of phthisis is, if not completely erroneous, at least of most doubtful accuracy,—and that it is either deficient in support of any kind, or rests merely upon the foundation of facts, erroneously understood or too few in number.[1]

[1] This conclusion does not appear to me to be invalidated by some facts, very recently communicated to me by Professor Martinez del Rio, of Mexico, with whose high acquirements and probity in matters of science I have long been well acquainted. Mexico is situated in the midst of a valley, 6560 feet [2000 meters] above the level of the sea, near a lake with marshy borders. The soil of the town itself is very damp; water is found at a depth of two or three feet below the surface. The atmosphere is extremely rarefied and evaporation very rapid; this, combined with the high tem-

The facts derived from the statistics of the British army are perfectly in harmony with those collected by Dr. Rufz at Martinique. This physician—who may be pointed out as a model for imitation by all practitioners desirous of making private practice conducive to the advancement of our science—states, in an essay already quoted,[1] that of 1954 patients treated by him between 1836 and 1839, 123, or about 13 per 100, were phthisical,—or 11 per cent., setting aside some persons established at St. Pierre. But among these patients were very few children,—contrary, as M. Rufz observes, to what happens elsewhere; two only, in fact, were children.

SECTION II.—EXCITING CAUSES.

§ 1. *Influence of pneumonia and pleurisy.*

It is an opinion long since accredited, and at the present

perature, explains the dryness of the atmosphere. The temperature of Mexico is always mild; although the difference of seasons is very distinctly marked. The winter lasts scarcely two months (December and January), and the cold is even then so slight that the sun is sufficient to warm the houses, and render fireplaces things as yet unknown in Mexico. On the other hand, although the town is in the 20th degree of north latitude the heat is not very great; this is explained both by the elevated site of the town and by the occurrence of periodical rains in the summer; in fact, from the middle of June to the middle of September, rain comes down in torrents from three to seven o'clock in the evening, rarely later. Hence the general conclusion, that Mexico enjoys an extremely mild climate, and does not suffer from sudden atmospheric variations. The medical men of the town are of opinion that phthisis is rare there, except among the military. M. Martinez himself adopts this opinion. Still the facts which he has communicated to me (and which are too few in number to decide the question) do not appear to me altogether favorable to the notion in question. Of forty post-mortem examinations, performed by M. Martinez at Mexico, two were in cases of persons cut off by phthisis; three of patients dying of other diseases, but nevertheless presenting tubercles in the lungs; three others of persons advanced in years, the apices of whose lungs contained five or six indurated tubercles. That is to say, that in eight (or one fifth) of forty bodies examined by M. Martinez, the lungs were tuberculous. It is the more advisable not to conclude phthisis to be rare in Mexico on the evidence of this small number of cases, as it appears to be common, according to the statement of the local medical practitioners, in the military; and we have seen, in respect of the island of Malta, that the proportion of phthisis does not differ much in the military and civil population.

[1] Etude de la Phthisie à la Martinique (Mém. de l'Acad. Royale de Méd. t. x, p. 223, Paris, 1843). [There are some errors in the figures in the text.—Tr.]

day rather prevalent, that phthisis is produced by inflammations of the lungs and their membranes. Now, the following statements comprise what I have observed on this head in respect of pneumonia, in wards which, as I have already said, were equally divided between males and females.

Of eighty phthisical subjects, whom I carefully examined respecting all diseases they had suffered under, previously to the outset of the tuberculous disease, three had pneumonia four years before death; and from that time they had coughed and expectorated uninterruptedly. Four others had had the same disease, three, six, and fifteen years before the manifestation of the first symptoms of phthisis, without having been more subject to cold within these periods than before, and without having suffered from dyspnœa; all were of weak constitution and lymphatic temperament,—two of the principal conditions regarded by practitioners as predisposing to phthisis. These cases are mutually subversive; and if any inference at all be deducible from them, it is, that pneumonia is without influence on the development of phthisis.

It will no doubt be urged that this conclusion is overturned by a multitude of facts, and more especially by the observations of Broussais. Without meaning to contest the accuracy of these observations, I cannot help remarking that they do not appear to me quite to signify all that they have been alleged to prove. Pleurisy and pneumonia, acute and chronic, are very common in the army; Broussais opened a great number of soldiers cut off by both affections, and finding tubercles in the lungs of several of them, fancied he had discovered the cause of these productions in the inflammations named. But, in order to render his conclusion logically correct, the author should have drawn up tables of mortality, and ascertained whether the proportion of tuberculous individuals dying in the military hospitals were greater than that of subjects cut off, *at the same average period of life,* in the civil hospitals. Until this be done, it is perfectly obvious that the proposition of Broussais is simply conjectural, inasmuch as the relationship between these two very different diseases might be one of mere coincidence, instead of one of mutual dependence. This is the more likely to be true, as the period of life—from the twentieth to the thirtieth year —at which phthisis most commonly declares itself, is precisely

that at which Broussais so frequently observed pneumonia and pleurisy.

Not only do the observations referred to signally fail in proving that pneumonia is a cause of tubercles, but the history of this inflammation appears to me to demonstrate the precise contrary. In truth, pneumonia most commonly spreads from the base to the apex of the lungs (Bayle), and the development of pulmonary tubercles almost invariably follows the opposite direction; pneumonia rarely coexists on both sides of the chest, phthisis almost invariably implicates both lungs; phthisis is less frequent in males than females, the contrary is the case with pneumonia. Of seventy-five pneumonic patients, observed by myself, twenty-three only were females; eighteen of the number died, and of these, fifteen were men, three only women.

These facts are, as is obvious, strongly opposed to the doctrine of irritation. I do not mean to affirm that pneumonia *cannot* have any influence on the development of pulmonary tubercles; for who can assign the limits of the possible? But such influence appears to be matter of the merest conjecture; nor do I believe it possible—supposing that it really does exist—to demonstrate that existence, except by means of the tables of mortality, of which I spoke a moment ago, and in which a comparison should be instituted between individuals dying under different and clearly-determined circumstances. However admitting, even now, the influence in question to be as positively established, as it is in reality, on the contrary, matter of strongest doubt, it cannot be supposed to be considerable in amount, inasmuch, as out of a far from inconsiderable number of cases collected with care, I have not found a single one deposing in its favour.

The same reflections are, in great part at least, applicable to *pleurisy*. I have observed this affection more frequently in males than females, though not with so much greater frequency as pneumonia; it implicates only one side of the chest, whereas it is very rare to find pulmonary tubercles in one lung only. I may remark here, that, having given my attention particularly to this point since the publication of my former edition, I have found pleurisy—when it attacked individuals in the actual enjoyment of good health, and free from symptoms of disease of any kind at the moment of attack—invariably terminate by the recovery of the patient. Nor did it leave after it any trace

of disease, neither cough nor emaciation,—nothing, in a word, justifying a suspicion of the existence of tuberculous affection, even in the latent form, of the lung. This statement is founded on the observation of nearly two hundred cases of simple uncomplicated pleurisy which have fallen under my notice within the last fifteen years. Hence the really important point, as a guide to correct prognosis, in cases of pleurisy, as of numerous other affections, is to ascertain carefully the state of the lungs, and other viscera, at the moment the invasion of the inflammation takes place: if they be healthy, and the patient labour under no other malady, the prognosis is favorable.

Does it follow from all this, that pleurisy can have no influence, either proximate or remote, on the production of tubercles,—and that it cannot in any case promote their development? We shall presently see that facts do not permit us to go so far as this; but it is rendered obvious by those just related, that if the influence in question does act, it can only do so in very rare and perfectly exceptional cases. The existence of the error hitherto prevalent is the more readily intelligible, as it could not, unless by the greatest attention on the part of the observer, be avoided. In truth, one of the first effects of the formation of tubercles is the occurrence of pleurisy, generally speaking of the dry form, sometimes attended with effusion; and the observer would almost inevitably, when the tubercles are not discovered till a later period, attribute them to the pleurisy, whereas in reality the pleurisy depends upon them.

The observations which I have made since the first edition of this work appeared, are precisely the same as those I had made previously. My first inquiries have been confirmed by subsequent researches; and the facts related by M. Grisolle in his admirable Treatise on Pneumonia, must have removed any lingering doubts that might still have existed on the subject.[1]

"With the view," says this writer, "of accurately ascertaining what species of connexion existed between pneumonia and pulmonary tubercles, I questioned seventy-two phthisical subjects upon the various ailments they had experienced previous to their admission into hospital. Now of these seventy-two patients, two had had more or less severe and well-marked pneumonia three

[1] Traité pratique de la Pneumonie aux différents âges, p. 466. Paris, 1841.

or four years before the outbreak of the first symptoms of phthisis; their recovery had been perfect: two other patients had had pneumonia eighteen months or two years before; and from that period they began to suffer from cough and dyspnœa, and to lose flesh a little. These results differ little from those obtained by M. Louis, for of eighty phthisical patients interrogated on the subject, he only discovered three who had had (four years before death) an attack of pneumonia; in these persons it was from the event in question that the invasion of cough and expectoration dated.

"Thus the facts which precede," continues M. Grisolle, "demonstrate that the symptoms of phthisis may sometimes supervene consecutively to acute pneumonia; but are we justified in inferring thence that an evident and established connexion of cause and effect exists between the two affections? I cannot think so. I believe with Laennec, that in the great majority of cases the tuberculous affection has existed before the pneumonia, and that the tubercles, acting as irritant bodies, are the true exciting cause of the disease. Indeed morbid anatomy proves this: for in the majority of individuals who die of pneumonia, and have tubercles in their lungs, these productions are generally of tolerably large size, more or less softened, and in a word show by their very aspect, that they have not been produced within a few days. However, I lose no time in adding, that I by no means deny that an eruption of tubercles may take place in consequence of, or during convalescence from, an attack of pneumonia. Thus M. Andral has occasionally seen several small miliary tubercles scattered throughout the substance of a hepatized lung; and has several times observed, both in the human subject and in the horse, that lobular pneumonia is attended with the formation of miliary tubercles, while these productions did not exist in the portions of lung that continued healthy. But what else can we reasonably infer from these facts, unless it be that if these individuals had not already tubercles in the lungs, these organs at least contained their germs? And it is intelligible that the inflammatory process of which the lung was the seat might have sufficiently modified the nutrition of the organ to excite the deposition of tubercles to which the individual was already predisposed."

"I conclude from what precedes," adds M. Grisolle—"1st, that

phthisis does not immediately follow pneumonia, except in very rare cases (less than one thirtieth of the whole number); 2dly, that even under these circumstances it is by no means proved that the tuberculous affection is a consequence of pneumonia,—all presumptive evidence goes, on the contrary, to support the notion that the tubercles existed before the pneumonia, and have, perhaps, acted as its cause; 3dly, that in cases of exceeding rarity (since for my own part I have never observed such), where miliary tubercles have appeared to form in hepatized lungs, the pneumonia has then acted as the exciting, and by no means as the proximate cause. And I consider the deposition of tubercles through the influence of pneumonia, in persons simply predisposed to the disease, as an occurrence of great rarity. Thus, among the 305 patients, whose cases I have analysed for this work, 22 presented those peculiarities of constitution which are commonly regarded as forming a predisposition to phthisis; besides, more than one half of them had had one or more of their nearest relations cut off by phthisis, and yet all these individuals without exception recovered from the attack of pulmonary inflammation, and left the hospital perfectly restored to health. Nor did the pneumonia in these cases differ, either in respect of its cause, its symptoms, or its progress, from the ordinary pneumonia occurring in subjects not predisposed to the tuberculous affection."

§ 2. *Pulmonary Catarrh.*

The influence of pulmonary catarrh on the development of tubercles does not appear to me to be more satisfactorily demonstrated than that of pneumonia. Of the 80 patients who were enabled to give me an account of the diseases they had suffered under previously to the outbreak of phthisis, 23 only were very subject to attacks of pulmonary catarrh, while 52, or about two thirds of the whole number, were rarely so affected. What conclusion can we possibly draw from these facts, but that phthisis occurs indifferently in persons subject to pulmonary catarrh, and in those who are not prone to suffer from it; and consequently, that we cannot consider it as one of the effects of the latter affection, or connected with it by any obvious tie.

The same conclusion is forced upon us by another order of

facts. Females who, according to my observation, appear more exposed to phthisis than men, are less subject to pulmonary catarrh, at least to pulmonary catarrh sufficiently severe to induce the patient to seek medical aid. Thus, of 149 cases of this affection collected by me before 1825, 52 only, or about one third, were furnished by females.

Hence, whether we examine inflammation of the pulmonary parenchyma or that of the mucous membrane of the bronchi, in connexion with phthisis, we arrive at the same conclusion, namely, *that the sex which appears the more prone to phthisis, is the less subject—in the ratio of* 1 : 3*—to both those inflammations.*

It is obvious that no mere arguments, however specious, can henceforth warrant the idea that pulmonary tubercles are the result of chronic inflammation of the bronchi, the tissue of the lung, or the pleura; the proposition I have stated cannot be overturned except by a series of facts more numerous than those I have collected, and proving that the proportions existing in my cases were the effect of chance.

And if, in opposition to all probability, it were urged that the difference in proportion of phthisical subjects in the two sexes was too inconsiderable to be of any real weight, my statements would still not the less hold good; inasmuch as there would even then be no relationship between the frequency of phthisis and of pulmonary catarrh, or pneumonia, in the male and female.

And were it even proved to demonstration, by a series of well-observed cases, that these two affections exercise a direct influence on the development of phthisis, it would not even then have been shown that they are its necessary cause,—that without one or other of them, phthisis cannot exist. My cases of acute phthisis appear to me to prove the precise reverse of this. The first of them relates to a young woman subject to colds (Case XXXVII), who had never had pneumonia, and was perfectly well at the time when she was seized with rather sharp fever, soon followed by cough and expectoration. She died on the thirty-fifth day of her illness, and a large mass of tuberculous matter was found at the base of one of the lungs, softened, and partially evacuated, gray semi-transparent granulations, &c. It is evident that the granulations and tuberculous matter were not in this case the effects of inflammation of the bronchi; to

justify us in maintaining such an opinion, we should first have proved that the bronchitis of a day may give rise to the formation of tubercles, &c. But I have too much respect for my readers to suppose them capable of holding such an opinion, or others equally improbable; and I consider it as clearly demonstrated, as anything can be, that in the case in question the development of phthisis was independent of inflammation of any kind. The other cases of acute phthisis speak quite as clearly as this. I may refer in particular to Case XXXVIII, referring to a man, who generally enjoyed good health, and was suddenly seized, without assignable cause, in the midst of perfect health, with fever, followed by cough, and who died on the thirtieth day of his illness. The lungs were found filled with an immense quantity of gray semi-transparent granulations, while the mucous membrane of the bronchi was *perfectly healthy*, with the exception of a slight violet discoloration, which could only be ascribed to stasis of blood occurring during the last moments of life, and is frequently observed in cases of sudden death. I may also recall to the reader's recollection Case XL, relating to a young man, aged nineteen, who was in the enjoyment of good health, when he was seized, without any known cause, with cough and fever, and in whom enough tuberculous matter had accumulated in the lungs by the twentieth day, to render the percussion-sound dull. I might say the same of Case XLI, and more especially of Case X, in which the sound was dull under the right clavicle, on the seventeenth day of illness, although, in this latter case, the affection did not advance so rapidly to its fatal termination. In fact, of 123 subjects, 6 (the twentieth part of the whole number) afforded so many direct proofs that phthisis may be developed, independently of any inflammatory affection of the pulmonary parenchyma or of the mucous membrane of the bronchi.

And the same inference is deducible from almost all my cases of latent phthisis. The individuals referred to in Cases L, LI, and LII, were affected with simple phthisis. In them cough and expectoration had been preceded, for six months or a year, by continued fever, of more or less perfectly remittent type; and in consequence of the absence of complications, we saw that this fever could not be otherwise than the result of the action of a certain number of pulmonary tubercles, developed inde-

pendently of pneumonia or catarrh, inasmuch as neither of these affections existed at the time. In support of this assertion comes also Case IV, in which cough and expectoration did not set in till the fourth month of intense diarrhœa, and not until six weeks before death. Here, in truth, the size and structure of the pulmonary excavations showed, beyond the possibility of doubt, that the tuberculous matter was developed before cough commenced. The latter then was the effect, and not the cause.

Thus not only is any influence on the part of pneumonia, pleurisy, and pulmonary catarrh, on the development of phthisis not demonstrated, but my cases incline to show that such influence is either imaginary, or that, if it exists, its amount is exceedingly limited. I have, as it appears to me, just proved that in the twelfth part of the cases which fell under my notice, the formation of tubercles took place independently of inflammation of the tissue of the lungs, of the pleuræ, or of the bronchi.

However, it must be admitted that—in consequence of the slow progress of phthisis in the majority of cases, of the resemblance of its initiatory symptoms to those of simple pulmonary catarrh, and of the more or less inflammatory state of a part of the bronchi in phthisical subjects—it is not surprising many medical men should believe that inflammation (more especially that of the mucous membrane of the bronchi) is the cause of tubercles. But this opinion, as we have already seen, cannot, at least in the majority of cases, it appears to me, be any longer maintained.

There is, besides, another fact, not less certain than those which precede,—one that corroborates, and might to a certain extent replace them all: it is that, as I have elsewhere said before, *the bronchi are commonly healthy near crude tubercles, or masses of gray semi-transparent matter* (Case LII, &c.); so that the red discoloration and thickening of those in communication with the tuberculous cavities would appear to be effects of the constant passage of the contents of those cavities. I may add, that in subjects who die from some other affection than phthisis, but yet have *crude* tubercles, or gray granulations in the lungs, the bronchi are almost always found perfectly healthy, in respect of colour and thickness. Facts of this kind are not rare; I have lately even observed several of the kind,

and it is enough to have seen one, to feel convinced of the frequent independence of pulmonary tubercles of inflammation.

The additional investigations upon which I have entered, since the publication of the former edition of this work, have corroborated the results of my first inquiries, and rendered the conclusions which I had deduced from facts still more sure and evident. Thus, all the cases of acute phthisis I have analysed supplied so many examples of a perfectly healthy state of the bronchi, even of those of the apices of the lungs. In forty-two post-mortem examinations of individuals affected with vesicular emphysema of the lungs, I found only ten cases in which a small number of gray semi-transparent granulations existed at the apex of those organs,—a proportion lower than that found by myself in individuals cut off by all diseases indiscriminately, and who had not, like persons labouring under vesicular emphysema, suffered from more or less intense pulmonary catarrh for a series of years. I may add, that in the ten cases in question, the tubercles were not more advanced nor more numerous where the emphysema was most marked and of oldest standing than in the others,—an additional proof of the independence of tubercles of pulmonary catarrh.[1] Lastly, I have collected eleven cases of dilatation of the bronchi, in subjects who appeared to have laboured under this affection for a space of time, varying from two to six years at the time of death; in eight of them the mucous membrane of the bronchi was, besides being treble or quadruple the natural thickness, of intense red colour, granular-looking or mammillated, and in three only of the eleven subjects did tuberculous complication, and this in an unadvanced state, exist.

Another fact, not less important than the preceding ones—though it be not supplied by morbid anatomy—is that acute pulmonary catarrh of any intensity, and which is seated in the ultimate bronchial ramifications, commences at the base of the lungs; this is a rule to which I have not met with a single exception, since I first, now ten years past, ascertained its existence.

Is it possible, in the teeth of facts so numerous, so easily established, and so unanimous, to maintain that inflammation

[1] Mémoires de la Société Médicale d'Observation, t. i, p. 180.

of the mucous membrane of the bronchi is a powerful or common cause of phthisis?

§ 3.

Unusual excitement of the lungs of long duration, but not inflammatory in nature, does not suffice to produce the development of pulmonary tubercles. The following facts appear to me to place this beyond question. Of 42 subjects labouring under organic diseases of the heart, and whose cases I have collected, 19 were affected with hypertrophy of the right auricle with or without dilatation, 29 with a similar alteration of the ventricle on the same side. In 6 of the latter cases the pulmonary artery was besides dilated and hypertrophous throughout its entire extent and in all its ramifications; it was at once broader than and as thick as the aorta, before its bifurcation—a condition which must have been the result of very unusual force in the propulsion of the blood into the lungs. Now there were pulmonary tubercles—and these but little advanced—in 2 only of these 42 cases of cardiac disease; whereas, in 50 cases of cancer of various organs, also collected by myself, there were 11 examples of the complication in question.

§ 4.

Must we then conclude from all this, that all kinds of excitement, *marked and prolonged febrile action,* for example, is without any influence on the development of tubercles? I think not, and for the following reason. Of 46 patients cut off by typhoid fever, and whose cases I collected, 4 presented some tubercles or semi-transparent gray granulations at the apex of the lungs; and these subjects had died from twenty-five to forty-six days after the invasion of the disease. None of those cut off earlier in the disease presented such a state of the lungs; from which it would appear natural to conclude (everything else being the same, in truth, except the duration of the febrile action) that this must have contributed to the production of the tubercles in question. But supposing that this inference is a just one, and admitting that another and more numerous series of cases would lead to a similar result, it must not be forgotten that typhoid fever is, of all the acute affections of these climates,

that attended with the most violent febrile action, and that in the cases in question, this febrile action was, besides, of rather protracted duration.

I wrote thus in 1831.[1] Since that time I have had numerous opportunities of verifying the correctness of the view then taken. And when I reflect that an acute febrile disease, the principal seat of which is far away from the lungs, appears, nevertheless, to act in some cases as an exciting cause of the generation of tubercles, I cannot avoid asking myself whether, in the very rare cases wherein those products are developed in the course of pneumonia, the febrile action, accompanying the disease, may not have had its part in bringing about such development? Nor can I entertain any doubt, for the same reason, that tubercles may sometimes form, during the course of simple pleurisy, and during that of every other equally simple acute disease, provided it have run a course of some length, and the attending febrile action have been of some severity.

I may add to all this that the non-dependence of tubercles on pneumonia and bronchitis is not confined to temperate climates like our own, but that it also appears to exist in hot countries, or at least in a certain number of them. Thus, of 1954 patients treated, between the years 1836 and 1839, at St. Pierre, in Martinique, by Dr. Rufz, 3 only were affected with pneumonia, and not a greater number with bronchitis; whereas 123 laboured under phthisis.

§ 5. *Hemoptysis.*

Hemoptysis was long considered an exciting cause of phthisis; and M. Fournet, in an extensive work recently published, adopts the obsolete notion. But it is impossible to discover the foundation upon which this writer bases it; for no proposition is at the present day more satisfactorily proved, in the opinion of all accurate observers, than the extreme rarity of hemoptysis of any amount, unless as a dependence upon tubercles; so that admitting, *argumenti gratia*, that attacks of hemoptysis of this kind are sometimes the exciting cause of a deposition of tubercles, the fact could not be proved. It is

[1] Annales d'Hygiène publique et de Médecine légale, t. vi, p. 55.

impossible, then, in the existing state of things, to regard hemoptysis, either of considerable or trifling amount, as a cause of tubercles.

§ 6. *Cold.*

Cold has always been considered one of the most active agents in the production of tubercles, and as one of their most common and most obvious exciting causes. To such a degree was this opinion carried that it was long supposed tubercles were peculiar to northern climates; and this error has in no small measure contributed to give currency, first among medical men, and subsequently among non-professional persons, to the opinion that a warm climate is a sort of panacea for phthisis, at least when the disease is not far advanced. Even at the present day opinion is divided upon this point, and many practitioners still regard cold as one of the most powerful and most common exciting causes of phthisis. Thus, quite recently, M. Briquet has believed himself justified in concluding that in 52 of 109 patients observed in his wards, cold was the exciting cause of that disease.

I have also endeavoured to ascertain what might have been the influence of cold on the development of the disease, in cases observed by myself; and as has been already seen, the conclusions at which I arrived were very different from those of M. Briquet. Subsequently, reflecting that, if cold be really an efficacious cause of phthisis, that affection must commence more frequently in winter than in summer, or in the cold than the hot months, I ascertained the month in which the earliest symptoms of the disease manifested themselves in my patients. I found, that of 170 patients cut off by phthisis. at the Hospital of La Charité, 74 experienced the first symptoms in the warmest months of the year (April, May, June, July, August, September); [1] and 76 in the coldest months. [2] In 127 patients

[1]

April	12
May	13
June	12
July	11
August	10
September	16
Total Cases	74

[2]

October	13
November	12
December	10
January	16
February	11
March	14
Total Cases	76

admitted into the Hospital Beaujon, and in whom the period of origin of the disease was inquired into with great precision, 66 contracted it in the warmest ;[1] and 61 in the coldest months of the year.[2]

Here then are two groups of cases, collected at different periods, and in different hospitals, both leading to the same conclusion,—namely, that phthisis commenced an equal number of times in cold and warm seasons. And were the number of cases analysed greater, the necessary and logical conclusion would be that cold is without appreciable influence as an exciting cause of phthisis. These facts are further remarkable in that they constitute a new line of demarcation between phthisis and pulmonary catarrh, which is incomparably more frequent in winter and in the severe season than during summer.

Another circumstance lending support to the inference above drawn, is that females who, at least at Paris, are better protected from cold than males, are nevertheless more subject to phthisis.

The admirable essay of Dr. Reynaud on the Quadrumana in the Menagerie of Paris has been quoted as furnishing evidence of the influence of cold on the development of tubercles ; as almost all of these animals die phthisical. But before drawing such an inference from the facts, we should know the causes of death of the quadrumana in countries they naturally inhabit, and ascertain whether they are seldomer tuberculous than at Paris. And supposing the affirmative proved, it would still remain for us to ascertain if change in habits of life, sequestration, &c. did not play a great, nay, even the most important part in producing the disease. It is said that almost all the cows kept in stables at Paris die phthisical ; it

[1]

April	10
May	13
June	11
July	7
August	11
September	14
Total Cases	66

[2]

October	17
November	7
December	14
January	11
February	8
March	4
Total Cases	61

is obvious that the affection cannot, in this instance, be ascribed to cold, from which the cows in question are perhaps only too well protected. There is consequently more than one motive for doubting whether cold has really the influence on the development of tubercles which it has been supposed to exercise.

PART III.

TREATMENT.

Before describing the system of treatment of phthisis, which appears to me, in the existing state of knowledge, the most appropriate, I consider it necessary to undertake a succinct inquiry into the real efficacy of the chief means which have of late years been brought forward as the most capable of arresting the progress of the disease, and effecting its cure. The strictest spirit of conscientiousness shall guide me in this investigation; and if I commit any error in the attempt to appreciate the facts before the profession justly, I shall trust to the kind indulgence of my brethren. The task, they will readily perceive, is an ungrateful one, and its accomplishment the more irksome in proportion as I have found it difficult to participate in their views.

I shall commence with the salts, and examine successively the action of ioduret of iron, of chloride of sodium, &c.

CHAPTER I.

APPRECIATION OF THE PRINCIPAL MEANS WHICH HAVE OF LATE YEARS BEEN BROUGHT FORWARD, AS BEST CALCULATED TO ARREST THE PROGRESS OF PHTHISIS.

SECTION I.—PROTIODURET OF IRON.

This medicine, which appears to have been introduced into medical practice by M. Dupasquier of Lyons, has been employed

by him for several years past in the treatment of phthisis. He expresses himself as follows on the subject in the 'Compte Administratif' of the hospitals of Lyons for the year 1835:

"The protioduret of iron, administered to phthisical patients in the dose of from twelve to thirty or forty drops per diem,[1] is borne without difficulty by patients, and exercises its influence especially on the pulmonary organs.

"The effects of this medicine most commonly become apparent in the course of a week. Of every ten patients affected with phthisis in its third stage, at least six or seven experienced very obvious effects and marked relief, from its use. After a few days' employment, prompt decrease, amounting almost to suppression, of expectoration takes place, with diminution of the cough and dyspnœa, decrease followed by cessation of perspiration, diminished frequency of the pulse, decrease of heat and fever, restoration of strength and appetite, &c. Occasionally, all these changes are observed simultaneously, in some instances they occur one by one.

"Sometimes, however, notwithstanding the improvement in the symptoms, the patient continues to grow more and more feeble, and gradually sinks. But frequently, on the other hand, even in cases where the existence of a cavity has been satisfactorily established, the improvement becomes more marked from day to day, the patient recovers flesh and spirits, the cough and fever cease, and he leaves the hospital in a state of cure, which, there is motive for hoping, may in some cases prove permanent."

The mode in which the protioduret acts is, according to M. Dupasquier, as follows:—It diminishes, and eventually causes suppression of suppuration from the ulcerated walls of cavities; cicatrization may then be effected, and if there be but one cavity, or but a few, the cure may be permanent. Should unsoftened tubercles remain after the cicatrization of the cavities, the absorbent action of the protioduret of iron may cause their removal by absorption, and under these circumstances also, the cure may possibly prove a permanent one.

If a great many different places be in a state of suppuration,

[1] The protioduret should be prepared according to the formula inserted by M. Dupasquier in the Journal de Pharmacie for 1842.

and the forces of nature are incapable of effecting such extensive cicatrization as would be necessary, the lungs cannot resume the discharge of their functions, and in spite of temporary improvement, the patient eventually sinks.

"To sum up," says M. Dupasquier, "this new medicine, which I have introduced into medical practice, exercises a very powerful action on the pulmonary organs; it most commonly produces a rapid and marked improvement in the symptoms of phthisis,—such an amount of improvement as could not be expected to follow the use of any of the remedies employed in the treatment of the disease; and lastly, it sometimes produces real and permanent cures."

"The medicine," says M. Dupasquier, "spoils very readily, requires much care in its administration, and once changed by the action of the air, not only ceases to produce the effects I have pointed out, but disturbs the digestive organs."

During a visit paid to Paris, a year ago, M. Dupasquier came to the Hospital Beaujon, and was kind enough to make (in my presence, and that of the apothecary) some of the solution of protioduret of iron (such as he employs himself), in the manner described by him in the 'Journal de Pharmacie.' I have since that time administered this medicine either in private practice[1] or in the hospital, to upwards of sixty patients labouring under phthisis, in all its various stages; and in no single case (I state the fact with astonishment, for the assertions of M. Dupasquier, who is both a skilful chemist and an enlightened and honorable practitioner, had inspired me with much confidence,)—in no single case, did I observe any improvement which could be ascribed to the new agent. However, the assertions of M. Dupasquier are so positive, and it is so difficult to admit that he can, at least very frequently, have been deceived in the diagnosis of phthisis, that I should recommend further trial of the protioduret, in solution if possible,—or, according to the surer plan, in pills. The solution may be administered without the least inconvenience to patients, for several successive weeks, in increasing quantity, from fifteen to fifty drops a day, divided into two doses; the vehicle should be syrup. The medicine determines no immediate effect (so long as it is not carried beyond the

[1] When used by me in private practice, the protioduret was made by M. Boudet.

doses mentioned,) which can make it necessary to suspend its exhibition.

It must not be forgotten too, that M. Dupasquier is far from regarding the protioduret of iron either as a specific, or as a panacea; and is very far from ascribing invariably good effects to its employment.

I have also tried other preparations of iron in phthisis, as well as the protioduret, namely, the sesquioxide and the lactate, both of them with little success. It is true, that, in order to obtain accurate conclusions, I took care not to put my phthisical patients on any of these ferruginous preparations till six or eight days after their admission; because daily experience shows that a few days' regulated diet, combined with the use of diluent drinks, will suffice, perfectly unassisted by active treatment of any kind, to produce an improvement in the state of their various functions, to cause decrease of thirst, improvement of appetite, a better appearance in the sputa, greater facility in expectorating, &c. It is perfectly clear that unless the precaution to which I now refer be taken, a certain improvement, in reality depending upon regimen alone, may be ascribed to the influence of some pharmaceutical preparation, and the observer thus deceived into most serious errors. It is more than probable that omission of this precaution accounts, in great measure, for the utterly different views of practitioners concerning the action of medicines.

SECTION II.—CHLORIDE OF SODIUM.

The consideration of the claims of this salt, recently introduced in the treatment of phthisis by Dr. Latour, naturally follows that of the protioduret of iron. Introduced almost at the same time, and under the same circumstances, and like it, recommended with emphasis, and on conviction, kitchen-salt is of immense utility, according to M. Latour, in the treatment of phthisis.

The treatment of phthisis with sea-salt is exceedingly simple, and consists almost solely in giving this salt for two or three successive months in gradually increasing doses of from half a drachm to about a quarter of an ounce [2 to 8 grammes] daily.

It may be taken either in broth, or mixed up with bread, and its action aided by a succulent diet and mild bitters.

According to M. Latour, the first effects of the medicine are, on an average, manifested in five or six days, sometimes sooner, sometimes later.[1] The appetite is first distinctly influenced; the patients feel a more frequent desire to eat. As an effect of increased nourishment, continues the author, the important functions of life are, as a matter of necessity, modified; nutrition is more effectually performed, the strength returns, night-perspiration, if it existed, diminishes in amount,—febrile action decreases in violence, and ultimately disappears. Two months or two months and a half of the use of the chloride of sodium, in progressively increasing doses, have almost always sufficed to produce these effects.

M. Latour does not say that it is a matter of indifference, as regards the success of the treatment, that the affection shall be in its first or second stage; but he cites the case of a patient who had, in all probability, a vast cavity at the apex of the right lung, and who was very rapidly restored to health, without appearing to consider the case an exceptional one. So that, according to this writer, sea-salt, associated with proper regimen, may cure phthisical patients, whose lungs are excavated, who have fever, and no doubt also softened or crude tubercles in abundance, in the lungs.

However M. Latour (well acquainted, as he is, with the importance of accurate methods of inquiry, and of the necessity of submitting facts to numerical analysis, in order to arrive at truth, and convince others that we have done so,)—M. Latour does not inform us how many patients he has treated in this or that condition, and how many of them recovered. An omission such as this cannot but be regretted, in the case of success so remarkable, so unhoped for, and so utterly clashing with received opinion, that it must be met with no little incredulity. It is above all to be lamented, that M. Latour should have feared to accumulate examples of cure in his book (p. 131), and that he has thought it right to limit himself to the following few lines, as sufficient description of a case so remarkable (p. 131). "Mademoiselle B., No. 30, rue Hautefeuille, aged

[1] Traitement préservatif et curatif de la Phthisie, p. 141. Paris, 1840.

fourteen; in a very advanced stage of phthisis; cavity at the apex of the right lung; extreme emaciation; general symptoms exceedingly severe. This patient was seen by Drs. Baron and Scott. The treatment commenced on the 13th of April, 1839, was closed at the end of May, and followed by complete cure."

Assuredly such cases cannot be accompanied with too full details, and had we such by hundreds, still they should be related with the greatest minuteness, for this is the sole way of imparting our convictions to others. Let M. Latour increase the number of his cases, and detail them with greater minuteness, and I am convinced not a practitioner will hesitate to assure himself by his own experience of the value of the proposed treatment.

For my own part, having been long acquainted with the merits and probity in matters of science of M. Latour, I lost no time in submitting the effects of sea-salt to clinical examination. In the year 1839 I gave this salt, in the doses and in the manner described by M. Latour, to every phthisical patient received, for five months successively, into my wards at the Hôtel-Dieu. In not one single case did I observe any appreciable effect produced in the functions. Some patients could not be induced to take the salt for more than a few days; by far the greater number took it for a month and upwards; and I repeat that during that time I did not observe any change or amelioration in the state of the patients, which could by possibility be ascribed to the chloride of sodium,—nothing in short which is not usually observed in phthisical subjects, placed in the same circumstances, and submitted to a different treatment. These patients, it is necessary to add, were almost exclusively, or as far as their stomach would bear it, fed upon roast meat.

It is true that M. Latour objects by anticipation to any cases in which sea-salt might have been administered in hospitals; in which establishments, according to him, though acute diseases may be treated with success, those of the chronic class cannot be so treated, on account of the deficiency of comfort in them. However, a considerable number of chronic diseases—chlorosis, gastralgia, vaginal discharges, diarrhœa, pulmonary catarrh, chronic pleurisy, &c. &c.—are constantly treated successfully in hospitals; and there is no apparent reason why the case should be different with phthisis, so soon as a really effica-

cious mode of treatment shall be discovered for this terrible malady,—more especially if (as is in the present instance alleged to be the fact) the effects of the chief therapeutical agent become manifest after a few days' use. In truth, this notion of M. Latour is inadmissible; and if further trials, made in the hospitals by persons versed in the study of pulmonary disease, were not more successful than those undertaken by myself, no one could hesitate to consider M. Latour the victim of self-delusion.

SECTION III.—SUB-CARBONATE OF POTASS.

Very recently, and at about the same time that M. Latour believed himself called upon to counsel the use of sea-salt in the treatment of phthisis, M. Pascal, of Strasburg, recommended the sub-carbonate of potass against the disease. M. Pascal founded his recommendation, *à priori*, on the discutient property of the alkaline salts, and more especially of the sub-carbonate of potass, in engorgements of various kinds. M. Pascal compasses the cure of phthisis by dissolving the albumen which, he says, forms the greater part of tumours and engorgements of all descriptions; while M. Latour fancies he has arrived at the same result by means of sea-salt, not through any solvent property possessed by it (for of this he makes no mention), but through its special tonic qualities, seconding the action of a succulent and tonic regimen.

But if the cases of M. Latour leave much to be wished for, on account of the poverty of details accompanying them, those of M. Pascal are so deficient in this respect, that it is really impossible to determine under what affections his patients laboured. I have considered myself for this reason absolved, at least for the present, from the duty of trying sub-carbonate of potass.

SECTION IV.—SAL AMMONIAC.

Sal ammoniac has also had the reputation of being a valuable therapeutical agent in the treatment of phthisis; and Dr. Cless,[1]

[1] Gazette Médicale de Paris, p. 8. 1832.

in his annual report on the patients admitted into St. Catherine's Hospital at Stuttgard, affirms that he has derived advantage from its exhibition in large doses in the treatment of incipient phthisis, while the tubercles are as yet in the crude state. He adduces, in support of his statements, several cases of persons who, having presented symptoms of incipient phthisis, were restored to health by the use of hydrochlorate of ammonia.

The majority of patients treated by M. Cless took from about six to about eight ounces [180 to 240 grammes] of sal ammoniac, within a period of from a fortnight to a month; one of them took sixteen ounces [500 grammes] in two months, another nearly twenty-six ounces [800 grammes] in the course of eleven weeks. The latter patient was better on leaving the hospital, without being perfectly cured; and in no case were the digestive organs put out of order by its use.

I can say no more on this subject; as I have not M. Cless's cases to consult, I can neither affirm nor deny anything on the matter.

SECTION V.—CHLORIDE OF LIME.[1]

Chloride of lime has especially been given and recommended as a powerful curative agent in phthisis by Dr. Hirzog, of Posen, who has administered it to a certain number of patients in the hospital of that town.

One of them, aged thirty-eight, presented, says the author, all the symptoms of phthisis, expectorated puriform sputa, and left the hospital cured after a treatment of fourteen days. Cutaneous revulsives were prescribed at the same time as the chloride of lime.—A second patient, aged thirty, had long suffered under various symptoms of phthisis, and had also quartan fever. The latter having been completely removed, the chloride of lime was administered, and after a lapse of five weeks and a half the symptoms of phthisis had disappeared.

Cases related with such brevity as this (I take for granted that the translator has not abridged them) are, as it will be readily admitted, not of a kind to produce conviction. Indeed the habit of many practitioners of suppressing, in relation to subjects so important as the present, details without which it is utterly im-

[1] Gazette Médicale de Paris, p. 411. 1832.

possible for other persons to form an opinion upon whatever matter is in question, cannot be too deeply lamented. Another reason for doubt in the present instance is, that according to the author, the chloride of lime appears to be particularly fitted for those cases of phthisis in which the disease has followed neglected pneumonia of slight severity.

M. Hirzog commences by prescribing about thirty-one grains [2 grammes] of chloride of lime in about six ounces [180 grammes] of distilled water with sugar, and sometimes with the addition of a quarter of an ounce [8 grammes] of cherry-laurel water. The patient at first takes four spoonfuls per diem, and in proportion as the treatment continues, the quantity of chloride is increased, but never carried further than a quarter of an ounce [8 grammes].

SECTION VI.—CHLORINE GAS.

Chlorine gas attracted for a certain time great attention as a supposed means, when administered with proper precaution, of curing phthisis, if not always, at least frequently, and at all periods of the affection. The disuse into which it has fallen does not appear to me a sufficient reason for omitting to inquire into its true value in the treatment of the disease; and I shall consequently briefly examine the facts brought forward by M. Cottereau and published in the twenty-fourth volume of the 'Archives de Médecine,' as these are the most interesting, so far as I am aware, that have appeared on the subject. I shall place the important facts of each case (as respects the question now under consideration) one by one before the reader; adding in each instance such remarks as appear to me called for, in order to make its signification intelligible.

Case 1. This case which is extracted from M. Gannal's 'Essay on Chlorine,' relates to a gentleman, whose age is not mentioned, and who had coughed and expectorated for two years when submitted to the treatment with chlorine, on the 21st of October, 1827. Besides the existence of cough and expectoration, dull sound had been detected at the upper third of the left lung. The cough and expectoration rapidly diminished; by the 1st of November the patient's state had greatly improved;

and the improvement advanced in such manner that by the 1st of January the dullness had disappeared. On the 8th of April following, the patient was perfectly restored to health.

No mention is made in this case either of emaciation, fever, hemoptysis, nor pain in the side; nor was the chest examined by auscultation; so that this case, as M. Cottereau himself observes, is not conclusive.

Case II is that of a lady of delicate complexion, who was seized on the 12th of April, 1828, without assignable cause, with dry cough and pains in the chest, for which thirty leeches were applied to the precordial region with benefit. On the 27th the cough and pain had increased and fever supervened. M. Cottereau saw the patient at this time in consultation; he found the sputa abundant and purulent, ascertained that there was continued fever with evening exacerbations, and considerable emaciation. He satisfied himself also of the absence of respiratory murmur at the apex of the right lung anteriorly; posteriorly, in the corresponding region and also in the axilla, there was strong bronchophony; dull sound in the *two upper thirds* on the left side, the mucous rhonchus on both sides. Five days later the same conditions were again observed.—On the 15th of May, thirty-three days after the manifestation of the first symptoms, the use of the chlorine was commenced. From the 16th to the 22d the cough and purulent expectoration diminished, and the sleep improved. From the 22d of May to the 1st of June the fever disappeared completely; the dullness of sound and bronchophony became much less marked; the strength and appetite returned. From the 2d to the 10th of June the improvement continued, the patient rose almost every day, her flesh began to return; on the 18th she was restored to perfect health, and has since that period always continued well.

In the narrative of this case, too, there is much deficiency of detail in regard of the diagnosis. Sixteen days after the invasion of the disease (an invasion which was not of the kind common in phthisis) the sputa are found puriform, and the percussion-sound dull over the upper *two thirds* of the left side; whereas on the right side also at the apex, marked bronchophony existed over a surface, the limits of which were not determined. Perhaps so extensively dull a sound as this, and bronchophony so strong, have never been observed just after invasion of the disease in a

case of acute phthisis attended even with the worst form of general symptoms; and this fact is in itself sufficient to warrant the question whether the case before us was not one of double pneumonia instead of acute phthisis. The puriform character of the sputa so shortly after the outset of the disease is another point justifying doubt; and the same may be said of the patient's rapid recovery, which can only be compared with that from pneumonia. Hence this case, which might on first sight appear so conclusive as regards the action of chlorine, has really not this character.

In Case III we have the history of a lady, probably of a certain age (she was wife of a retired officer of rank), born of phthisical parents, who was seized on the 16th of June, 1828, without appreciable cause, with a dry cough, which subsequently continued. Six weeks after the invasion, loss of flesh to a considerable amount was perceptible, her strength had greatly failed, the extremities were cold; she complained of pains between the shoulders and in the right side of the chest, and expectorated puriform matter in abundance, frequently streaked with blood. There was dull sound, accompanied with gurgling and pectoriloquy at the apex of the left lung; very copious sweats at night; the pulse was very feeble, and frequent in the evening.—August the 3d, the chlorine was commenced. Six days afterwards the sputa had lost their bad colour, and were brought up easily; on the 15th, the pectoriloquy and gurgling were still detected, but the extent of surface over which the dull sound was audible had decreased, and the intensity of the general symptoms diminished.—From the 20th to the 26th the appetite grew sharp; the cough, expectoration, night-sweats, and evening fever were less severe than before. From the 27th of August to the 3d of September the appetite continued good; scarcely any pain was felt in the chest; cough and expectoration occurred only in the morning; neither crackling rhonchus nor gurgling,—the pectoriloquy had become doubtful. Between the 16th and 27th of September the pectoriloquy and dullness of sound disappeared.—Between the 26th of September and the 10th of October the cough and expectoration ceased completely; and, on the 20th, the patient's health appearing to be completely restored, no further treatment was employed.

This case is no less remarkable than the preceding one, and

very much for the same reasons. The progress of the affection was here, too, very rapid, and the improvement followed so closely upon the use of the chlorine, as to be evident on the sixth day of treatment; on the fiftieth day the percussion-sound was natural;—and on the fortieth day of the disease, when the patient first fell under M. Cottereau's observation—the sputa were puriform and abundant! The last circumstance is remarkable, in that such is not generally the character of the sputa at that period, in cases of phthisis following an acute course. The restoration of the natural state of sonorousness of the chest, fifty days after the use of the chlorine had been commenced, is no less calculated to excite marvel, in a case of phthisis, whenever the anatomical changes were so considerable, as the results of auscultation and percussion compel us to admit them to have been here, before the employment of the chlorine. All these reasons justify the idea that an error of diagnosis was committed in the case, and that the affection was merely pneumonia of the upper lobe. For the fact of relations having died phthisical is no help in individual diagnosis, if I may use the expression. Had the details of the case been given with greater fullness, both in reference to the period preceding the administration of the chlorine, as to that succeeding it, no doubt could probably have been entertained as to its real nature; and here is an illustration of the importance of the extremest accuracy in the narrative of cases, as well when the advancement of therapeutics is in question, as that of other branches of our science.

The subject of Case IV was a Spaniard, aged 20, weak, and of nervous temperament, whose mother, two brothers, and sister had died of phthisis. After the commission of excesses of more than one kind, at the commencement of 1828, the patient experienced, on the 26th of July, a rather violent paroxysm of fever. On the following day he complained of headache, vague pains in the chest, and soon after, upon a slight fit of coughing, spit up from about five to six ounces [150 to 180 grammes] of florid spumous blood. The cough continued, and soon after dyspnœa, evening fever, and copious night-sweats supervened; the sputa were globular in form, and of greenish-yellow colour. About twenty days, perhaps (the period is not made out with precision) after the invasion, slight gurgling and doubtful pectoriloquy were detected under the left clavicle; and

the sound was dull over a surface of two inches and four lines [6 centimeters] below the clavicle. On the 29th of August, thirty-three days after the first symptoms declared themselves, the patient was given over; the cough was constant, the respiration laborious, the pulse 90, and more frequent in the evening; the appetite was gone, the features altered; he had only lost flesh to a moderate amount, however; he complained of pain in the front of the chest. On the 31st the administration of the chlorine was commenced. On the 8th of September the sputa were less abundant, and had lost their bad colour; the night-sweats less profuse.—Between the 16th and the 28th, some improvement in strength took place; the pulse beat 75 in the minute, the evening exacerbation was less marked, the perspirations had diminished very materially; the sputa resembled a solution of gum arabic, with a little thick mucus; the diarrhœa was inconsiderable, the appetite and strength returned.—From the 26th of September to the 9th of October the improvement became extremely marked; neither gurgling nor pectoriloquy could be detected; the percussion-sound was merely a little dull under the clavicle, and slight bronchial rhonchus was heard at the central and posterior part of the right lung.—From the 10th to the 15th the results of auscultation and percussion became natural, the cough almost ceased, and the inhalation of chlorine was discontinued on the 30th of October. However, on the 13th of November, after some excess at table, which brought on derangement of the digestive functions, the cough and expectoration returned; and although the results of percussion and auscultation continued natural, the chlorine was resumed, and continued till the 15th of December, when the patient had completely recovered his health.

Here also the invasion of the disease was of violent character, as that of an inflammatory affection, or of extremely acute phthisis; and its progress was perhaps more rapid than in the two preceding cases, inasmuch as after about twenty days' duration, gurgling and pectoriloquy were detected in a situation under the left clavicle, where the percussion-sound was dull. Phthisis of the most acute type does not commonly advance with this rapidity. Notwithstanding its severity, the disease yields with marvellous promptitude to a few inhalations of chlorine; and from the seventy-fifth to the eightieth day, counting from

the outset of the affection, no trace of morbid condition is to be discovered by auscultation and percussion ! These circumstances, which (on the supposition that the disease was phthisis without complication) actually savour of the supernatural, lead us to regret that the author should have been unable, as it appears, to examine his patients more frequently by means of auscultation and percussion; he seems to have examined the patients in either way but three times, and it is clear that this is not frequently enough to rectify the diagnosis (had any error been committed), and follow satisfactorily the retrograde course of the disease. An attack of rather copious hemoptysis no doubt occurred at the outset of the disease; and there is no difficulty in believing that it depended on the presence of some tubercles. But was there nothing more in the case than tuberculous disease? Was this disease or was it not complicated with some acute affection, to which the majority of the symptoms mentioned might be referred ? Here is really the problem to be solved; and for its solution the details given by M. Cottereau by no means suffice.

Case v relates to a Dutch merchant, aged thirty-five, very weakly, and subject to obstinate cough from his seventeenth year. When M. Cottereau saw him for the first time, the following phenomena were observed: general loss of flesh; leaden hue of the face; pulse 80; respiration laborious; dull sound posteriorly, at the left side, from *the base to the apex,* less marked anteriorly, except under the clavicle, where cavernous respiration, pectoriloquy, and gurgling coexisted; on the right side mucous rhonchus, without any change in the natural character of the respiratory murmur; cough troublesome; sputa purulent; dull pains between the shoulders, and night perspirations; loss of appetite, without diarrhœa or constipation,—the use of the chlorine was commenced on the 2d of September. From the 6th to the 14th he improved decidedly; the sputa became colourless. —On the 14th expectoration had almost ceased, and the mucous rhonchus disappeared. From the 19th to the 30th the dull sound, cavernous respiration, and pectoriloquy diminished; there was but little mucous rhonchus, and the gurgling had disappeared; the strength was returning, and the appetite improving. From the 1st to the 8th of October, neither sweats nor dyspnœa; he coughed and expectorated but seldom. From the 9th to the

18th the face natural, the appetite sharp, the flesh returning; neither pectoriloquy nor cavernous rhonchus; nothing but dullness of sound under the left clavicle; respiration natural elsewhere. The chlorine was continued till the 15th of November, after which time he remained well without relapse.

This case does not by any means appear to have been certainly one of phthisis. It will be remembered, in truth, that when the author saw the patient for the first time, he found the percussion-sound dull on the left side *from base to summit,* no doubt in consequence of the presence of pleuritic effusion; nothing is said, however, of the state of the respiratory murmur, or the resonance of the voice on the same side, except under the clavicle. Nor is any mention made of the subject afterwards. Such an omission as this, regarding a point so essential too, justifies a fear that the examination may have been conducted, in other points of view, somewhat carelessly; we cannot, for this reason alone, dwell upon the signification of the symptoms observed, and it may be inquired, whether this case was other than one of dilatation of the bronchi with pleurisy on the left side,—nothing can, however, be affirmed in either direction.

Case VI is that of a medical student, aged 26, and of delicate constitution, who was seized in May, 1827, with dry cough; this had become very severe in the month of August following. Several attacks of hemoptysis occurred then, at various periods. On the 27th of December, sharp pain supervened in the centre of the left lung, and spread rapidly towards the front of the chest; on the following day profuse hemoptysis took place. On the 4th of January, another attack of hemoptysis. On the 8th, sputa greenish, opaque, and abundant; pain between the shoulders; percussion somewhat dull *all over the chest,* completely so from place to place; cavernous respiration and gurgling opposite the painful place. On the 9th the use of the chlorine was commenced. From the 10th to the 17th, slight improvement in the symptoms. From the 21st to the 25th, appetite returned; food easily digested.—From the 26th of January to the 19th of March, severe diarrhœa, with fever of intermittent type, rendered it necessary, from time to time, to suspend the use of the chlorine and reduced the patient to a state of extreme emaciation. From the 20th to the 31st of March, the inhalation was continued

regularly, the cough, expectoration, and diarrhœa diminished, the appetite and strength began to return. From the 1st to the 20th of April, the cough, expectoration, gurgling, pectoriloquy, and pain in the chest ceased; the results of percussion and auscultation became natural everywhere, the appetite and strength returned, and the patient began to recover flesh. From that time his health was perfect.

If the existence of tuberculous disease, attested as it is by the occurrence of copious and repeated hemoptysis, cannot be denied in this case, we may at least be permitted to hesitate in adopting the author's opinion as to the perfect soundness of the lungs at the time when the patient appeared cured. How is it possible, in truth, to conceive, in the existing state of experience, that the respiratory murmur had returned to its natural state, in a subject who had had gurgling and pectoriloquy under one of the clavicles, three months before the cure, and whose chest, at the same time, emitted a somewhat dull sound, all over its surface? These doubts are the more legitimate, as in this instance, like the preceding, the state of the respiration was not ascertained throughout the side where the percussion-sound was generally more or less obscure, and as the successive changes in the dullness, preceding the restoration of perfect sonorousness of the chest, were not followed by means of attentive and repeated examination. No doubt, other respectable practitioners saw the patient with M. Cottereau, and appear to have observed what he describes; but this circumstance cannot alter my opinion. And as the case in question appears to be one of those distinguished by the intermittent character of their progress, it is matter of doubt, what part the chlorine inhalations played in effecting the cure. And if, besides, there were pleurisy here, as in all probability there was—it is perfectly intelligible that, after the cure of this inflammation, the tuberculous disease should cease to cause other than comparatively slight symptoms, and admit of such a general state of the system as should not prevent the return of strength, and of the outward appearance of health. All this is, in truth, nothing more than what is occasionally observed in persons who have used neither chlorine nor any other of the medicines so far enumerated.

The Seventh Case is that of a boot-maker, aged twenty-nine, of weakly constitution, having long suffered from dry cough,

who grew worse than usual in January, 1829, when the cough increased, and the patient lost his appetite and strength. On the 16th of April following, he was extremely thin and weak, had considerable dyspnœa during the paroxysms of fever, and expectorated with difficulty thick yellowish white sputa; the sound was dull *all over* the right side of the chest, especially inferiorly and at the left side in the upper and lower third; on the right side the respiratory murmur was weak inferiorly; mucous rhonchus, and pectoriloquy existed at the apex; on the left side, the respiratory murmur was everywhere clear, except above the breast, where a few crackling sounds were audible; the skin dry and hot, and there was fever in the evening. The chlorine inhalation was commenced in the evening. Between the 6th and 9th of May, the cough, sputa, and perspirations diminished, and the appetite improved. From the 11th to the 19th, the appetite and strength made further progress, and the fever became less violent. From the 20th to the 30th, the general improvement continued, but the auscultatory signs and those derived from percussion remained unchanged. From the 1st to the 10th of June, the strength and flesh of the patient returned, the fever ceased, as also the pain in the chest and sub-crepitant rhonchus; sound less dull; pectoriloquy doubtful; the patient works the entire day. From the 11th of June to the 5th of July, the cough, sputa, dull sound, and pectoriloquy disappeared successively; the bronchophony alone remained, the respiratory murmur being natural in every direction.—The patient, presenting all the external attributes of health, continued the chlorine inhalation a month longer.

Here again the reader is presented with an additional example of complication, as is denoted by the extent of the surface over which dullness of sound prevailed; and, as in regard of the preceding case, he no doubt regrets that auscultation and percussion were not more frequently practised, and that their results were not studied and compared with care. The increase in severity of the symptoms observed in the month of January, 1829, was in all probability, to say no more, due to some complication; and we can readily understand, as I have already said, that when such complication had disappeared, the symptoms should, one after another, undergo amendment quite independently of any action on the part of the chlorine. For this

reason, it is extremely doubtful, whether that agent exercised any particular influence at all. Besides, persistence of bronchophony with a natural state of respiration, as described, is a combination which cannot be admitted; and this throws additional doubt on the state of the patient's chest at the time he was considered cured.

The patient in Case VIII was a tinsmith, aged 30, of weakly constitution, born of a phthisical father, and seized in the month of February, 1829, with pain in the chest and dry cough, shortly followed by purulent expectoration, and soon after this, by fever, night-sweats, diarrhœa, and emaciation. Three attacks of copious hemoptysis occurred in the month of April. On the 13th of that month, the percussion-sound was rather dull in the *lower two thirds* of the right side of the chest, dull higher up; and mucous rhonchus, gurgling and pectoriloquy were audible all round the apex of the lung; on the left side, the percussion-sound was dull under the clavicle, and the respiration tracheal; pulse 98.—The chlorine inhalation was commenced on the 2d of May. Between the 11th and 25th, the sputa lost their bad colour, and decreased somewhat in quantity; the cough, perspiration, diarrhœa, and fever diminished—the pulse fell to 82, and the appetite improved, From the 26th of May to the 15th of June, the diarrhœa ceased, and the patient recovered strength. Between the 16th and the 30th, the fever, perspirations, and diarrhœa disappeared; the cough, expectoration, and pains in the chest became much less troublesome; the respiration resumed its natural character in the lower two thirds of the left lung, and in the corresponding half of the right lung; the gurgling had almost disappeared; the pectoriloquy and dullness of sound remained unchanged; the appetite became excellent, and digestion easily performed. Between the 1st and the 12th of July, the expectoration ceased almost completely, and the patient believing himself cured, went to the country. On the 10th of August, the dull sound continued as before, the pectoriloquy was inaudible; and rather laborious work, resumed within the last few days, brought on sweating. Three months later, the cough had not returned, and the patient continued well.

Here again is, most obviously, an example of complication, to which the exacerbation of the symptoms must be referred, as

well as the progressive improvement observed, in proportion as the pleuritic effusion or engorgement of the lung disappeared. In effecting this improvement it is matter of doubt whether the chlorine played any considerable part; and the remarks made on the preceding case are naturally applicable to the present.

Case IX presents us with the history of a lady, aged 28, of delicate constitution, and who had lost her father and one of her aunts from phthisis. She was seized at the close of February, 1829, after a miscarriage, with cough and expectoration, the sputa being thick and of yellowish white colour. Soon after the cough increased in severity, the sputa became purulent and even sometimes streaked with blood; evening fever and night perspirations set in; she lost flesh visibly, and complained of pain between the shoulders: under percussion the chest emitted a dull sound at both apices and opposite the *central third* of the left side. Where this dullness of sound existed, neither respiratory murmur nor vocal resonance could be detected,—except two fingers' breadth below the clavicle, where gurgling and pectoriloquy were audible. The catamenia had continued regular, and there had been no diarrhœa when the chlorine inhalation was commenced on the 5th of May.—On the 1st of August the strength was completely restored, the chest in the natural state, with the exception of dull sound opposite the cavity, and the severe winter of 1829-30 had no ill effect on the patient.

The details I have just given are the only ones bearing on the matter under consideration, contained in the ninth case; and it will be readily admitted that they are insufficient to give us an idea of the action exercised by the chlorine. And this is the more true, as if we take into consideration the precise results of percussion (dullness at the central third of the chest) we must here too admit the existence of a complication, the gradual removal of which would suffice to explain, in part at least, the patient's restoration to health. It is really impossible in the investigation of a matter so serious as that now before us, to take into consideration cases which are deficient in so many important details.

Case X refers to a merchant, aged 46, of weakly constitution, and several years subject to cough and expectoration of yellowish sputa, occasionally streaked with blood. On his arrival at Paris in June, 1829, the same symptoms manifested themselves, soon acquiring greater intensity than usual; the sputa became puru-

lent and more abundant than ever, pain in the chest supervened, local perspiration by night, evening fever and loss of strength. On the 6th July the right side was found contracted, and emitted a dull sound in its *upper two thirds*, where also cavernous respiration and rhonchus existed; marked bronchophony was detected opposite the third intercostal space; and the lung was elsewhere, in almost every part, impermeable to the air. There was nothing to be remarked on the left side except a little mucous rhonchus at the apex of the lung.—The chlorine inhalation was commenced on the 8th of June. Between the 9th and the 30th amelioration of the symptoms took place; subsequently the occurrence of slight hemoptysis (which was treated by bleeding) caused the inhalation to be suspended from the 30th of July to the 4th of August, both included. It was then resumed and continued uninterruptedly till the 1st of October, at which period, says M. Cottereau, the signs of phthisis had completely disappeared. Since then the patient's health has invariably continued good.

This case is still more unsatisfactory than the last. The narrowness of the right side of the chest was probably a consequence of former pleurisy, possibly occurring in the course of a tuberculous affection, which, after having stopped short in its course, might have given rise to symptoms such as those experienced by the patient,—such symptoms as (we sometimes see this) may not have given rise to any serious result. What became eventually of the impermeable state of the entire right lung, ascertained to exist at the time the patient was first seen, we are left to divine. Hence no inference can be drawn from this case in respect of the topic under examination.

The patient in Case XI was a Belgian lady, aged 23, of weakly constitution, who had lost a sister from phthisis, had coughed and spit for two years previous to the 2d of July, 1829, and had two attacks of hemoptysis shortly before that time. On the 2d of July the following phenomena were observed: emaciation; considerable weakness; sharp pain between the shoulders and behind the sternum; frequent cough; and yellowish sputa; dull sound, pectoriloquy and tracheal respiration under the right clavicle to an extent of three inches [8 centimeters] downwards; a few bubbles of mucous rhonchus heard there on the left side; fever with evening exacerbation; night perspiration confined to the chest; slight thirst; appetite very poor; constipation and

diarrhœa alternately; abundant leucorrhœa.—On the 6th of August the chlorine inhalation was commenced. From the 7th of August to the 8th of October (the inhalation having been very irregularly performed, and often suspended altogether) the pain, cough, and expectoration diminished; this improvement continued from the 9th of September to the 19th of October, and from that time till the 4th of January the patient improved but slowly, which was ascribed to the excessive cold of the season. From the 5th of January till the 6th of February the chlorine inhalations were given up, and the patient remained in *statu quo;* they were then resumed, and between the 7th of February and the 27th of April the symptoms gradually disappeared. On the 27th of April the chest seemed perfectly sound, and the patient exhibited all the appearances of excellent health.

Here there is still greater deficiency of details even than in the last case; and without by any means intending to deny the existence of tuberculous disease in this instance, I may affirm, that obviously no inference can be drawn in regard of the effects of chlorine.

Case XII contains the history of a lady aged 27, of delicate constitution, and one of whose sisters died phthisical. This lady had dry cough in 1827 (after a miscarriage), which increased especially during the month of April, when she was again pregnant; during this pregnancy she had frequent attacks of hemoptysis. On the 9th of July, 1829, she was in the following state: emaciation; leaden hue of countenance; moderate thirst; loss of appetite; frequent cough; sputa of greenish yellow colour; pain in the larynx and between the shoulders, especially towards the left side; voice almost extinct; one inch and two lines [3 centimeters] below the right clavicle, there was a clear sound on percussion, over a very limited space, everywhere else the sound was obscure, and dull near the clear sounding spot; cavernous respiration, gurgling, and pectoriloquy under the right clavicle; around the clear sounding place the respiratory murmur is inaudible, whereas everywhere else on the same side, it is tracheal and accompanied with crepitant rhonchus; on the left side the respiratory murmur is confused in the lower third; and some crackling sounds are audible at the apex; pulse 80; considerable fever in the evening, and profuse sweats at night; bowels obstinately constipated. The chlorine inhala-

tion was commenced on the 20th of July. Between that day and the 2d of August it was frequently suspended, on account of symptoms of irritation. Between the 23d of August and the 14th of September considerable improvement took place. From the 22d of September the patient's state was such as to prevent chlorine from being used any more, and solution of an hydriodate was used instead. On the 16th of October the chlorine was resumed, and on the 12th of November the patient considered herself perfectly cured. On the 24th of December the appetite and strength were in the natural state, and the patient was as full in person as ever; neither cough nor expectoration existed; the dullness of sound was limited in extent; the respiratory murmur absent where pectoriloquy had formerly existed, and in every other place natural. During the first three months of 1830 the patient's health remained perfect, in spite of the severity of the cold; but on the 26th of April in the same year, after suppression of the menses, the symptoms of an acute affection manifested themselves, (it was unconnected with the chest,) and the patient expired on the 28th of May.—At the post-mortem examination both lungs were found of a pale gray colour, generally very yielding and perfectly crepitant; the left adhered to the costal pleura by means of rather close cellular bands, and presented at the central part of the upper lobe, a tubercle of the size of a pea, surrounded with a grayish white thick resisting membrane, around which the pulmonary tissue was healthy; and higher up a few granulations in the crude state. The right lung was free from adhesions, and a portion of its upper part measuring nearly two inches [$4\frac{1}{2}$ centimeters] in length and about nine lines [1 centimeter] in width, was of deep colour, firm and hard and puckered; in this place a hard, almost fibrous, slate-coloured tissue, impermeable to air, appeared, and bronchi obliterated at the point of contact passed towards it; close to the edges of this product of cicatrization existed a tubercle half a line [1 millimeter] in diameter. In every other place the lungs presented the attributes of health.

This is an interesting case, and is a striking example, says M. Cottereau, of the advantages which may be expected from the administration of chlorine gas in phthisis.

No doubt the case is an exceedingly interesting one; and on

first consideration the conclusion which M. Cottereau draws from it would appear legitimate, but on more close examination this ceases to be the fact. In truth, at the time the use of the chlorine was commenced, the entire of the right side of the chest sounded more or less dull, except in a circumscribed spot, under the clavicle, where cavernous respiration and rhonchus and pectoriloquy were audible; while around the respiratory murmur was absent, and everywhere else more or less tracheal. Admitting with M. Cottereau that these symptoms and all the others, forming as it were their train, depended on the tuberculous affection, traces of this disease should have been found in a considerable extent of the right lung; now instead of this, a fibrous production at the apex, with a crude tubercle in its neighbourhood, were all that were found. This is enough to prove that M. Cottereau's conclusion is erroneous; and that the dullness of sound and tracheal respiration discovered almost all over the right side of the chest, when the chlorine inhalation was commenced, were the effects of an acute affection (probably pneumonia), after the disappearance of which, only those morbid changes which existed in the lung previous to its occurrence could possibly be looked for. Not only did the chlorine inhalation not promote the resolution of the tuberculous affection (which had evidently for some time stopped short in its course), but, ill borne as it was by the patient, proved actually injurious, by, at least according to all appearances, retarding the resolution of an attack of pneumonia which escaped detection.

The case, however, as I have said, presents great interest, inasmuch as it justifies the remarks previously made on the subject of similar cases, in which the phthisical disease was complicated with pneumonia, or pleurisy, at the time the chlorine was administered. It shows that, in these cases, as in that more particularly under consideration now, the utility of the chlorine inhalation was merely apparent; and that the improvement which followed its use depended, and depended solely, upon the resolution of the acute attack, complicating the primary malady.

The next question is, whether the gurgling and pectoriloquy, detected at the apex of the right lung, depended on the presence of an excavation, existing at that period, and subsequently obliterated by the fibrous production described. Such a sup-

position, implying, as it does, very rapid generation of the fibrous substance, does not appear to me admissible. It seems to me more likely that the pectoriloquy and gurgling were produced by the pulmonary inflammation, and that the cavity was even then obliterated. The absence of all respiratory murmur, in the place mentioned, cannot be accounted for, unless this view be adopted,—an additional motive for adhering to it.

Nor must it be forgotten, too, that at the time dull sound and tracheal respiration were detected at the right side of the chest, the patient suffered from pain in the left side,—that, in about the lower third of the same side percussion brought out a dull sound, and the respiratory murmur was confused,—and that cellular adhesions were found between the costal and pulmonary pleuræ. So that, in fact, when the chlorine inhalation was commenced with, there were at once pneumonia on the right side, and pleurisy on the left,—affections sufficiently serious to render the patient's condition at the time well calculated to excite alarm.

Lastly, I may avail myself of the opportunity afforded by the case of pointing out to the reader how important it is for the observer to free himself from pre-formed opinions of every kind, in order to qualify him for drawing legitimate conclusions from facts. Nothing, in truth, was wanting in the instance of the observer of this case, but a mind more free from preconceived notions, in favour of chlorine, to fit him for interpreting its phenomena in a more natural manner.

Case XIII, the last, is also a case of complication, and I consider it unnecessary, for this reason, to dwell upon it.

Hence there is, in fact and truth, not one of M. Cottereau's cases which demonstrates the efficacy of chlorine in phthisis, some of them are deficient in the details necessary to make the reader acquainted with the nature of the affection treated, and the author himself appears to place the first case in this category; the others are so many examples of double pneumonia or pleurisy, occurring in patients whose lungs contained a certain quanity of tubercles. And in these cases it is easily conceivable that the general symptoms, depending on the complication, once removed, after the use of a therapeutical agent, possibly more injurious than useful, the patient's health must have appeared in a satisfactory condition, and in this manner

deceived the medical attendants. In some cases, too, there was in all probability nothing more than an acute disease present, without complication of any kind.

These conclusions, which appear to me to flow naturally from the close examination of the cases published by M. Cottereau, harmonize perfectly with the experience of those practitioners who have had recourse to chlorine, in imitation of that observer.

Thus, of twelve patients, reputed phthisical, and to whom M. Bayle administered chlorine, one only recovered; and the author admits (as has been remarked by M. Toulmouche, of Rennes) that the patient, in this case, was only judged phthisical from the general symptoms. M. Toulmouche himself, who has carefully studied the effects of chlorine in the treatment of phthisis, and chronic pulmonary catarrh, only found it efficacious in the latter affection.[1]

I have myself studied the action of chlorine on upwards of fifty phthisical patients, at the Hospital of La Pitié, the Hôtel-Dieu, and the Hospital Beaujon. The chlorine (prepared at the Central Laboratory of the Paris hospitals) was inhaled from a vessel provided with two tubes. In no instance did I obtain any successful result from its employment.

These last negative results, combined with those obtained by MM. Bayle, Toulmouche, and many other practitioners,—and, I may add, the remarks above made on M. Cottereau's own cases—scarcely permit any doubt as to the fact of that highly respectable observer having been led into error, from his taking complicated affections for cases of simple disease, &c.

SECTION VII.—DIGITALIS.

Digitalis is a drug which has also been esteemed capable not only of improving the state of phthisical patients, but of curing them; and notwithstanding their unsatisfactory character, the profession is really indebted to M. Bayle for collecting together the principal facts bearing upon this subject. In summing up respecting these facts, M. Bayle remarks that of 151 persons, affected with phthisis and treated with digitalis by Saunders,

[1] Bulletin de l'Académie Royale de Médecine, t. i, p. 209; t. ii, p. 1035.

Fowler, Beddoes, Drake, &c., 83 recovered, 35 experienced temporary or permanent benefit, and 33 were in no degree benefited. He considers that, even supposing several of these cases were examples of chronic pulmonary catarrh, and not of phthisis, still a sufficient number of examples of cure would remain to deserve the notice of medical practitioners. He admits, that in consequence of the habit of writers of concealing their cases of failure, it cannot be inferred from these 151 cases, of which 83 were cured, that digitalis cures more than one half of phthisical patients; but he thinks we cannot refuse to admit that, out of an indeterminate number, several recovered.[1] In support of this conclusion M. Bayle adduces the testimony of his distinguished relative, the author of the 'Traité de la Phthisie,' who affirms that digitalis, in doses progressively increased, in some instances, to forty grains daily, appeared to produce very excellent effects in various species of phthisis, and even in tuberculous phthisis, when the patients were excessively excitable and the pulse very frequent. Lastly, adds M. Bayle, if, under the influence of the prevalent notion of the incurability of phthisis, we reject as false the 83 cases of cure reported in this work, we should set down as impostors upwards of twelve medical men, whose reputation is handed down to us as that of honorable persons; for it is impossible to admit that all these writers were constantly mistaken in the diagnosis of the disease.

This style of reasoning adopted by M. Bayle is fortunately not perfectly logical. We may doubt the alleged fact of the cure of the cases of phthisis reported by these authors, without throwing the slightest imputation on their good faith. Previous to the days of Bayle, the diagnosis of phthisis was really in a state of infancy; Bayle advanced it considerably, and it has made uninterrupted progress since. And we may consequently believe that (though they did this with the very best faith in the world) practitioners who indulged in extravagant—as will be admitted by every one—encomiums of the action of digitalis in phthisis were mistaken; and that they took, if not always, at least almost always, some affection of another kind for phthisis. It is to be recollected that in a tolerable number of cases, when the affection does not follow a rapid course, improved regimen

[1] Bibliothèque de Thérapeutique, t. iii, p. 362.

will in itself suffice to cause a marked amelioration in the symptoms, and that in some still rarer instances the disease stops short in its course under the influence of methods of treatment the most various. Now all these are circumstances of which authors have taken no note, which we cannot neglect, and which justify us in doubting the justness of the inferences drawn,—and this without casting slur upon the honour of any one, just as we may at the present day very fairly question the efficacy of the syrup of Belet in phthisis, without blasting the character of Portal. Let the reader remember, too, that the illustrious Bayle speaks only of improvement having been obtained by the use of digitalis, and that consequently the testimony, appealed to by his nephew, is of a doubtful character. Hence, all that can be concluded from the facts collected in the 'Bibliothèque de Thérapeutique' is that it would, perhaps, be well to repeat the trials made with this medicine by Bayle and others.

The small number of cases in which I have either in hospital or private practice prescribed digitalis within the last twelve years, have not supplied me with any positive result. The trials made in 1834 by M. Joret, in M. Andral's wards, are quite as unsatisfactory.

SECTION VIII.—HYDROCYANIC ACID.

Hydrocyanic acid is esteemed to possess the power of curing phthisis, by a certain number of practitioners, among whom Dr. Fantonetti, of Pavia, holds a particularly prominent place. In an essay of some length on this subject[1] Dr. Fantonetti relates cases, from which it would appear to result that prussic acid has, in truth, a prodigious influence over the course and termination of phthisis. If this apparent inference be a motive for briefly stating the particulars of some of these cases, it is likewise a reason for our accepting them with extreme reserve.

One of them relates to a coachman, who had kept his bed seventy-two days when he commenced the use of the acid. He was at that time thin, suffered from extreme dyspnœa, and continual cough, expectorated purulent sputa, presented cavernous

[1] Gazette Médicale de Paris, 1838, p. 793.

rhonchus at the apices of both lungs, more especially of the right, with pectoriloquy and œgophony inferiorly on the left side; he had night-sweats, slight diarrhœa, a pulse at 100 in the morning and 130 in the evening, and œdema in the lower extremities. After eight days' use of the acid, mucous and slightly cavernous rhonchus only were audible on the right side; after a lapse of ten days more, the sputa, cough, and fever, as well as the cavities had disappeared, the respiration was tolerably free, and the strength returning. Five days later the patient resumed his work as a coachman, and no relapse of any kind occurred.

That a patient should, after spending seventy-two days in bed, recover his strength under the influence of any given system of treatment, is by no means incredible; but that this should occur in a person affected with the hectic fever of tubercle, and when large cavities exist at the apices of the lungs, exceeds all powers of belief. The matter can only be understood by supposing that the author, imperfectly acquainted perhaps with auscultation, confounded pectoriloquy and gurgling with other sounds. Percussion was not practised,—in itself a sufficient evidence of M. Fantonetti's slight familiarity with the modern methods of examining the chest; for persons versed in both these modes of investigation would not employ one without the other. I think it unnecessary to quote any further from this source.

M. Magendie states that he has succeeded in curing persons presenting all the signs of phthisis in the first stage, and even at a more advanced stage, with the acid in question. I have been less fortunate; having failed in observing any successful result from the administration of medicinal prussic acid in phthisis.

SECTION IX.—CREOSOTE.

Creosote, like the majority of new medicines, has had its turn of trial in phthisis. M. Rampold[1] states, long experience has taught him, that creosote may be useful in some cases. It should not be employed when there is dry cough, an erethismal or inflammatory state present, or active hemoptysis; whereas

[1] Gazette Médicale de Paris, 1837, p. 7.

it may be exhibited with success when a tuberculous mass of some size softens suddenly, when a state of atony predominates, and no inflammatory condition is present. The author relates the cases of two patients (one of whom died), neither of them furnishing any evidence favorable to his views.

Dr. Elliotson[1] has also tried creosote in phthisis; and affirms that, under the influence of this medicine alone, a young man, presenting a large cavity in the left lung, recovered.

But admitting the correctness of the diagnosis in this case, as well as the fact of recovery having followed the use of creosote, what conclusion can be drawn from a single case,—one, too, of the details of which I have no knowledge?

SECTION X.—IODINE.

Dr. Gairdner has published an interesting essay (Formulaire de M. Magendie) on the effects of iodine in phthisis. Dr. Barron, of London, has also, as is said, administered iodine with some success in the same disease. But these first trials require to be repeated, says M. Magendie, before we can form any opinion as to the effects of iodine, administered while phthisis is but little advanced.[2]

M. Defermon, adds the celebrated physiologist, obtained excellent effects, in a young man affected with phthisis, from the following mixture, which was taken in drops of a table-spoonful every hour.

Lettuce water - - - -	℥iv [120 grammes]
Solution of hydriodate of potass -	gtt. xv
Medicinal prussic acid - -	gtt. x-xij
Syrup alth. - . . -	℥j [30 grammes].

MM. Guersant and Blache[3] state that pulmonary phthisis (which may, on many grounds, according to them, be assimilated to strumous affections) would appear to be susceptible of benefit by the influence of preparations of iodine, if certain results of MM. Brera, Callaway, Benaben, Gairdner, Barron, Haden, and Gassaud, be trusted to. But they add that these results, which

[1] Gazette Médicale de Paris, 1838, p. 543.

[2] Revue Médicale. t. i, p. 490. 1824.

[3] Dictionnaire de Médecine. 2ème édit. art. Iode.

are in general based on facts deficient in details, are not among the number of those verified by general experience.

Dr. Murray, in his dissertation on the 'Influence of Heat and Moisture,' &c., affirms that he has frequently employed iodine in vapour with advantage, in the course of phthisis, even in desperate cases. He has always observed improvement, at least, of a temporary kind, in the state of the patient; the cough diminished in violence, expectoration became easier, and the patient slept better.[1]

CHAPTER II.

TREATMENT.

I HAVE endeavoured in the preceding chapter to appreciate at the fair value, the various means which have of late risen into notice, as possessed of the greatest power of effectually influencing the course of phthisis, or even of effecting its cure; and, as we have seen, the best founded hopes in appearance have, one after another, vanished before scrutiny. This is, however, no reason that we should despair for the future, or adopt the opinion that we shall never succeed in discovering some agent or other, capable of effectually opposing the onward course of phthisis once developed. All that can be said at present is, that redoubled vigour is called for, that greater accuracy in investigation is needed, and that medical men should undertake those joint labours of which I have spoken,[2] and without which, the study of phthisis, especially of its causes and its treatment, cannot make any great or solid progress for the future. Meanwhile, in expectation of these systematic labours the commencement of which medical men, and the friends of humanity generally, should anxiously wish for, I shall lay before the reader what experience (unfortunately of a kind but too deficient in precision, as must not for a moment be forgotten)

[1] Arch. de Méd. 1831, t. xxv, p. 594.

[2] Advertisement to the present edition.

allows me to state as the most plausible views concerning the prophylactic and palliative treatment of phthisis.

SECTION I.—PROPHYLACTIC TREATMENT.

The prophylactic treatment, in the defective state of existing experience, can only be based upon the knowledge of the predisposing causes of phthisis; and in this respect medical science is, as we have already seen, in its infancy. What we know with greatest certainty upon the subject is, that hereditary influence and lymphatic temperament really constitute a strong predisposition to the development of the disease; and that, consequently, it is in the case of lymphatic children, and those born of phthisical parents, the prophylactic treatment should be applied.

According to some practitioners, nothing can be more easy than to modify the lymphatic temperament; whereas daily experience proves that, in point of fact, nothing is more difficult, even when we have within our reach all imaginable appliances, and means for attaining that object. However, in spite of such inability (proved as it has but too often been), we should use all our efforts to produce the desired modification; and for its production the chief things to be relied upon are activity of life, a succulent diet, the use of bitters, complete change of habits, if the individual be of a certain age, and a judiciously laid out and healthful place of abode. An infant, born of lymphatic parents, or in whose family cases of phthisis have occurred, should be intrusted to a young nurse of vigorous constitution, presenting as far as possible the characters of the sanguineous temperament, and whose parents enjoy perfectly sound health. The nurse should have as succulent a diet as her stomach and her habits permit, and she and the infant live in a large well-ventilated room, having, if possible, a southern aspect. She should take healthful exercise, without allowing herself to feel fatigued; it is advisable, too, that the infant be taken into the open air as much as possible; no apprehension need be entertained from slight coldness of the air, provided the atmosphere be pure, and free from fog, and there be no strong wind blowing.

When the infant attains the age of seven or eight months

he should have, in addition to the breast-milk, a little chicken-broth, with or without bread, and with or without semoulia. It is matter of importance that the cradle be closed on one side only, in such manner as to ensure a constant renewal of pure air around him. The back should be rubbed with dry flannel two or three times daily.

At a later period, when the infant has been weaned, some animal food should be added to the lighter articles of diet, and the state of the digestive process watched with care. Should the appetite appear less keen than it ought to be in an infant of that age, a small quantity of very weak bitter infusion, without sugar, may be given twice a day. Children readily become habituated to infusions of this kind; it should be had recourse to with some frequency, and appears to me much preferable to the syrups commonly given with the same views. If the development of the infant, notwithstanding these precautions, advance in an unsatisfactory manner, he should be washed in cold salt water,—care being taken on each occasion that the skin be perfectly free from moisture, and actually dry.

We occasionally meet with children of about two years old, who do not sleep soundly, and we are unable to detect any obvious cause for this. Such a state of things cannot be otherwise than injurious to the constitution,—more especially to that of the lymphatic infant, to whom our consideration is at present particularly directed,—and it should be remedied as quickly as possible. A few drops of syrup of poppies, given two or three successive days, generally suffice to restore sleep, and with this produce an obvious improvement in the health. The use of opium at so early an age is, even in the minute dose mentioned, considered injudicious by some highly respectable practitioners, from the apprehension of the practice interfering with the intellectual development of the child. But I can relieve them of their apprehensions, having had some experience on the point; the small quantity of opium I have recommended does not even temporarily affect the intellect of the child;—it on the contrary renders it more active, because it ensures a better state of general health.

At a still later period, the infant, continuing to inhabit a room of good or large dimensions, with a southern aspect (the reader will not forget that I write in France), may be put on

diet consisting in great part of meat, and especially of roasted meat. The bitter infusion should be given from time to time, and the bathing in cold salt-water continued; a little claret may be given at meals. Towards seven or eight years of age gymnastic exercises should be employed, but in moderation; they must be given up in summer for example, unless swimming be included anong them; but river or sea-bathing, more especially the latter, invariably proves of great utility, whereas gymnastic exercises, properly so called, exhaust the strength when the weather is very hot, and do more harm than good.

Instead of endeavouring by all possible means to strengthen the constitution of weakly children, springing from phthisical parents, some practitioners apply blisters to the arms, with the intention of keeping them open to an indefinite period. I have myself seen cases of this kind; I have known females, born in opulence, who had had a blister in one arm in this manner from the tenderest age, die phthisical at the age of twenty! Such a practice cannot be too strongly reprobated; experience shows its inefficacy, and it cannot in reality do otherwise than, by diminishing the strength and injuring the constitution, promote the occurrence of results perfectly opposed to those it is the object to ensure.

Preparations of iron might be substituted with advantage for bitters, where pallor of the tissues is one of the more striking peculiarities of the child or young person whom we desire to preserve from phthisis.

The conditions in which a child of the kind we have been considering is placed, do not exclude the propriety of cultivating his understanding; some application to study, combined with plays and sports, is more favorable than injurious to health. We have a very obvious proof of this at Paris, in boarding-schools for young ladies. These young persons generally enjoy better health at school than at home, in all probability in consequence of the regular habits of these establishments, and the absence of amusements, which lead to late hours and fatigue, and consequently deteriorate the constitution.

Regularity of habits, a just appropriation of time to study, and exercise of the body, occupation of well-ventilated rooms with good exposure, succulent diet, the use of bitters and chalybeates, and cold bathing are then what we should recom-

mend to persons of all ages, more especially to those who are of lymphatic temperament, and whose relatives (father, mother, or others) have fallen victims to phthisis.

It might have been matter of belief formerly, that the mere removal during the winter from a cold to a warm country, would suffice to guard persons of weak constitution against tuberculous disease. At the present day, however, this belief is very much shaken among non-professional persons even, and it cannot any longer be held by medical men, now that various statistical documents have shown that phthisis prevails in warm as well as in cold countries, and attacks the soldiery of a northern nation removed to the south very much in the same manner as if they had remained in their native land. Nevertheless, as change of climate necessarily entails a more or less complete change in habits; as living in a warm climate during winter allows persons to take exercise in the open air during a long series of days, when they continue almost inevitably confined to the house in cold and damp countries, we are forced to admit that weakly individuals, inhabiting a cold climate, must derive benefit from removal to warm latitudes in winter. And without by any means feeling certain that we shall thereby preserve them from phthisis, we may, and in certain cases we ought, to recommend removal to the south during that season. Dr. Schedel mentioned to me lately, that in a family which had lost sixteen children in youth, and at the same age by phthisis, the seventeenth child, sent at a tender age far away from his native country, escaped the disease which had been so fatal to his family. It may be urged, it is true, that here was a simple coincidence; the more so, that a single case can very seldom be made the subject of correct inferences.

As respects the exciting causes, those at least which the majority of authors consider such, pulmonary catarrh, pneumonia, pleurisy, &c. &c., all possible precautions should be taken to prevent their occurrence. Not, it is true, that they are to be feared as exciting causes of phthisis, for we have seen that it was impossible to ascribe this character to them, but because they are some of them dangerous *per se*, and because the debility they leave behind them, and which may last for a length of time, must affect the constitution injuriously and predispose to disease of various kinds. It is to be remembered, besides, that protracted febrile action, which to all appearance so frequently produces the

development of acute disease, may also act as an exciting cause of tubercles (p. 504); and that here is an additional motive for making every effort to prevent the occurrence of such diseases as are accompanied with fever.

It is not very uncommon to observe women of weak constitution, and of all classes of society indifferently, become phthisical while suckling, and the development of the tuberculous disease is at once set down to the influence of that function. Ought we then, from the apprehension of her becoming phthisical, to prevent a woman who is not very strong from suckling? I may observe in the first place, that examples are not wanting of rather delicate women who never enjoy better health than while suckling; and that, secondly, as the function is one which is generally exercised at the period of life when tuberculous disease is most frequent, that affection must be sometimes developed while it is going forward: otherwise we make it matter of necessity to admit that lactation is a preservative against the malady. Further, phthisis sometimes declares itself in women of strong constitution while suckling; so that were the question one regarding the mother only, I should say that slight delicacy of constitution need not prevent a female from *making the trial* of suckling her child. Even in respect of the infant, the breast of its mother—especially if there be no tuberculous members in her family—might possibly be better for it than that of another person; but as we have no proof of this, it is better in our existing state of ignorance to let the child have another nurse possessing the characters of health and fitness enumerated just now.

The precepts laid down in this section may be followed by persons in easy circumstances; but what counsels can we offer to people of the working classes in respect of their children, when either their temperament or the previous health of their family inspire fears of their being particularly disposed to become phthisical. The first step it appears to me is to improve the morals of the people, so as to wean them from the excesses which so frequently destroy their health, and induce them to economise their means, without which precaution they are often unable to satisfy the wants of nature. Until this be effected, the only advice we can offer such persons, with the object now under consideration, is to select for their children such trades as are more healthful than others.

SECTION II.—PALLIATIVE TREATMENT.

Although we cannot in the existing state of knowledge entertain the hope of curing phthisis, we may at least hope to retard its progress by well-directed system. But in order not to deceive ourselves as to the value of the therapeutical agents employed in the treatment of tuberculous disease, it is essential to bear in mind that in a certain number of cases the affection stops short in its progress spontaneously, and exhibits no tendency to run a fatal course. And besides, we must remember, that after having remained stationary for a space of time, sometimes of considerable duration, it may then run a very rapid course, while the observer is perfectly unable to account for so complete a change in the character of the affection. In considering the treatment, as the pathology of the disease, we must admit a first and second period,—keep in view the fact of its acute and chronic forms,—and bear in mind, that while in some cases it maintains the character of an almost simple affection, giving rise to but a small number of symptoms, its symptoms are in the majority of cases exceedingly numerous.

§ 1. *Chronic Phthisis.*

FIRST PERIOD.

At the commencement of this period (when the signs derived from auscultation and percussion taken in connexion with the qualities of the sputa and the other symptoms, are scarcely sufficient to convey a clear and satisfactory notion of the state of the disease), if there be but little or no febrile action, and neither sharp thoracic pain nor diarrhœa, gentle vegetable tonics are indicated, provided the patient be of lymphatic temperament and moderately strong constitution. If the cough be at all troublesome, preparations of opium—or of stramonium, should the former, which is rare, have failed to relieve it effectually—must be had recourse to, especially in the evenings. Opium frequently produces so material an improvement in the symptoms, that the patients fancy themselves cured, or almost cured, after having taken a few doses. The dose should vary in different

cases, so that for a commencement and until the amount of susceptibility of the patient for opiates be well ascertained, about a third of a grain [2 centigrammes] will suffice for an adult. But if this first dose do not produce relief, it should be gradually increased by giving four, six, or eight centigrammes and upwards of the extract, if no contra-indication be present.

In some cases opium relieves more promptly and effectually when given in enema than when swallowed; it should, therefore, be exhibited in the former way, if it fail in producing its effect in the form of mixture or pill.

The inhalation of the vapour of warm water or of some narcotic infusion, should be had recourse to once or oftener in the day, for six, eight, or ten minutes on each occasion, if the cough continue troublesome in spite of regulation of diet and the use of narcotics.

I just now advised the use of gentle bitters, which it is not the usual habit to prescribe at the present period of the disease. This is a point to which it will be well to return.

In the first place, it is a generally admitted fact at the present day,—one indeed upon which the most judicious persons are almost unanimous,—that phthisis, or the tuberculous affection, is a disease involving the system generally; that hence local remedies are insufficient, and that the object must be to modify the constitution as completely as possible. I have supposed that the patient to be treated was not strong, of lymphatic temperament, or born of phthisical parents,—that is to say, placed in certain conditions which promote the development of the disease, and probably accelerates its progress when it is developed. Now in such a case as this, instead of emollients and milk diet, tonic medicines and diet are indicated; their effects on the patient should of course be carefully watched. Any other plan would stand in opposition to known facts, and to the most positive knowledge we possess on the etiology of tubercle. I do not consequently recommend, or rather I dissuade patients from, the use of asses' milk, unless the stomach be so extremely susceptible (as is fortunately very rare) that nourishment of every other kind disagrees with it. I more particularly dissuade persons from its use at Paris and in other large towns, because no doubt asses fare as cows; and the latter animals are said by veterinary surgeons to die phthisical in large

towns. I cannot for this reason help suspecting the qualities of their milk, and abstaining from its administration in such places.

To the bitters taken daily to the amount of two or three cupfuls, may also be added some chalybeate water at meals, that of Bussang, Spa, Pouges, &c. Or some artificial preparation of iron might be used; and of these the protioduret is to be preferred, although it is not by any means yet proved that it exercises a special action on the progress of phthisis, or a more effectual one than other preparations of the same metal.

If, as is very common, the patient suffer from thirst in the evening, solution of some syrup or other, warmed to the same temperature as the apartment, may be taken; or what is often more effectual than the most agreeable drinks, some very slightly bitter infusion. Or a little cool, very weak, chicken-broth may be used for the same purpose, as it is preferred by many persons to other drinkables.

Issues, which have been considered by more than one physician as prophylactic against phthisis, but on insufficient grounds, are still constantly prescribed at all periods of phthisis with the view of arresting its progress, or warding off the hour of its fatal termination. The practice appears to me to rest on no results of just experience, and I cannot recommend it. We constantly see phthisical patients admitted into the hospitals, who have had issues placed under the clavicles or in the arms, soon after the invasion of the disease, without any apparent modification in the progress of the affection having taken place, even for the briefest period. The same facts are observed in private practice also. I have, in truth, never noticed any improvement follow the application of issues to the arms or under the clavicles which could legitimately be ascribed to them. We should then abstain altogether to employ them, in spite of usage; or at least never consent to their employment, except on the earnest solicitation of the patient, or more especially of his friends,—for in conducting the treatment of a disease which almost invariably terminates fatally, it is matter of importance to prevent the chance of after-regret, which would not be the less bitter, because in reality without foundation. Besides, by employing small issues and watching them carefully, they may be freed almost completely from the usual inconvenience.

It is of great importance to preserve phthisical patients from the influence of severe weather, and to make them wear flannel, if they do not already do so, at least during the continuance of cold: during the summer some less warm substance may be substituted for the flannel. The common practice is to apply flannel to the upper half of the body; whereas some practitioners, few in number, it is true, but of great merit, prefer applying it to the lower part of the body, with the view of gently counter-irritating.

But if we bear in mind the fact that the active congestions which sometimes arise during the course of phthisis, in organs more or less remote from the chest, do not prevent the principal malady from following its course, we shall feel little disposed to place confidence in this mode of procedure. The plan has something specious about it on first consideration, but, as it appears to me, is far from having received the sanction of experience. I should have no hesitation about the propriety of following the ordinary plan of recommending the application of flannel to the chest, incontestably useful as this is in pulmonary catarrh.

Removal from a cold to a warm climate during the severe part of the year, may also aid in producing the same effect, namely, preservation of the patient from atmospheric vicissitudes. Such change must obviously be of advantage in this point of view, independently of the beneficial influence which complete change of habits may exercise on the constitution. Living in a warm climate during winter will not, it is true, absolve the patient from the necessity of observing numerous precautions; but it enables him (when the affection is still recent, febrile action slight or altogether absent, and the failure of strength but slight) to take exercise in the open air during the greater part of the cold season. It helps, also, to maintain the patient's strength; and exercises some influence, perhaps, in warding off thoracic complications, if not always, at least frequently; and in this point of view the change, for the winter, from a cold to a milder climate may be of a certain amount of utility. We should not then hesitate to recommend such change to persons whose means enable them to effect it; while we at the same time acquaint their relatives with the uncertainty of success. Patients are, in truth, daily sent to warm countries with results the most various. Those who as yet present but few physical

signs of the affection, and who have little or no fever, appear often to be benefited by a sojourn at Nice, Pisa, Rome, Hyères, Pau, &c., during the winter, and feel themselves either a little better, or at least not worse at the end of that season than during the autumn. But these persons, when leaving the country they commonly inhabit, were placed under the most favorable circumstances; they had little or no fever, and were among the number of those in whom the disease may drag through a lengthened course in all climates, and in all classes of society; facts, of which I gave some remarkable examples, when engaged with the subject of the Course of Phthisis. When the patients are placed in different conditions, when the physical signs of phthisis have been manifest for some time, or when the disease has not existed long, but is nevertheless accompanied with considerable emaciation, fever, &c., the result is very different; the symptoms almost invariably continue to grow worse, even amid circumstances, to all appearance the best calculated to modify them beneficially. Hence, without meaning to deny the beneficial influence of the transition from a cold to a mild climate on the progress of tubercles, it may be affirmed that this influence is of doubtful character, notwithstanding the marvellous facts related from time to time on the subject,—facts which from the mere circumstance of their rarity prove absolutely nothing. Such cases can, in truth, be referred to as occurring in all climates; the proportion in which they occur is unknown, and obviously requires to be ascertained before we can accurately learn what influence is exercised by warm climate on the course of phthisis. Until then, until we have discovered what proportion of cases of phthisis stop short in their course in persons passing the winter in a cold climate, and in those who leave it for a warm one, *all other things being equal*, we shall be confined to surmises more or less plausible, and have no positive and real knowledge on the subject.

Other facts, of somewhat a different stamp from those hitherto reviewed, display the extreme reserve necessary in endeavouring to estimate the influence of change of climate on tuberculous disease. Thus, I have seen females, affected with phthisis for some time, pass two successive winters in warm climates, return to Paris with the local disease somewhat more advanced than at the time of their departure, pass two succeeding winters in Paris,

in apartments fitted for persons in their situation, and *cough less and feel better* than in the south. Have we not here a double proof of the slight influence of a warm climate, in winter, in retarding the progress of tubercles, in persons usually inhabiting a cold or temperate country?

What I have said upon warmth of climate may be applied to *sea voyages;* which have been extravagantly lauded, and perhaps altogether without just motive, by writers on phthisis. Nothing is proved incontestably on this matter for several of the reasons above pointed out, and because no doubt, in a good number of cases, errors of diagnosis were committed; errors which are not unfrequently committed still at the present day. Thus I have very recently seen a patient who had just arrived from America, and believed himself cured of tuberculous disease, for which he had been sent to Europe. This person had in reality had nothing but simple pulmonary catarrh, which had undergone considerable improvement. I do not deny the influence of sea-voyages on the progress of phthisis; but I say that such influence has not been demonstrated, and that the question of its reality is one still open for the decision of accurate experience.

But admitting the utility, unfortunately limited at the best according to all appearances, of removal from a cold to a warm climate on the progress of phthisis, all patients cannot avail themselves of it. Those so incapacitated should take all varieties of precaution during the winter, in order to lessen as much as possible the inconveniences of climate. They should, if within their reach, inhabit a large-sized room with a southern aspect, never leave the house on foggy, damp, or cold days; whereas, they may and ought to go out when the weather is mild and but slightly damp, and more especially when it is cold and dry (provided the cold be not too keen), while the sun is still above the horizon. All this is on the supposition that the strength is not too far impaired, and that the patients have little or no fever. It is obvious that patients of this stamp should not be submitted to a very strict system of diet; but the quantity of food allowed should be proportional to the activity of their digestion and their appetite,—those articles of food being preferred which contain a good deal of nourishment in a small compass. If they are of lymphatic constitution or born of phthisical parents, roasted meats (not of the white class) are more

advisable than other kinds of food; vegetables, though not to be excluded from the diet, are less advisable than meat. If the patient drink Bussang water, or some other gently tonic mineral water at meals, he had better not take weak wine and water; otherwise this beverage should be used in small quantity, especially in the morning with the fullest meal. The evening meal should in truth be very light, in consequence of the febrile action, more or less marked, which comes on that period of the day.

I have so far supposed that the amount of fever present was not very great; under the contrary circumstances, (there is sometimes, as is well known, very high fever at the outset of phthisis, even when the disease does not run a very rapid course,) the sedative preparations, whether opiate or other, and the watery or narcotic fumigations should be retained; but instead of the tonic, some pectoral infusion used, or solution of some agreeable syrup, or a very weak infusion of orange leaves. Unless there be signs of plethora, or some of the symptoms to be presently spoken of occur, recourse should not be had to bloodletting. Under the same circumstances, were the appetite small, the diet should be limited to weak broth, eggs in milk, jelly, isinglass, a few oysters, &c. &c.; for it is to be remembered that the affection is not an inflammatory one, and that consequently the diet should not be precisely such as is indicated in diseases of that character.

The preceding observations are to be understood to refer to simple cases. But such is not always the character of the affection; secondary symptoms of great importance sometimes supervene, even during the continuance of the first period of the disease, and require very active treatment. I shall enumerate the chief of these.

Hemoptysis, when of inconsiderable amount, often ceases spontaneously, and does not, under these circumstances, call for much modification in the treatment. A few very hot foot-baths, sinapisms to the lower extremities, laxative enemata, slightly acidulated drinks at a low temperature, perfect repose of mind and body, and the observance of silence, generally sufficed to stop hemorrhage of this kind. But when the effusion is copious—when, for instance, it occurs to the amount of from three or four ounces to a pound and upwards within the twenty-four hours, or sometimes in a much less time, and when, more espe-

cially, the abundance of the hemorrhage is such as to endanger life by suffocation—then the succour administered must be prompt and energetic.

Venesection is assuredly one of the means the most universally employed against scvere hemoptysis, and although it is but too often unsuccessful, we can scarcely avoid having recourse to it, when the patient retains a certain amount of strength and flesh. If loss of blood from the arm does not in such cases stop the hemorrhage, it at least is not particularly injurious. But when patients are of an originally weak constitution, or are enfeebled by the disease, bleeding, if not successful at once, might be productive of serious mischances. We should then have recourse, first, to extract of rhatany root, to tannin, or other analogous medicines, in progressively increasing doses; to cold drinks, either acidulated or astringent, as citric or sulphuric lemonade, decoction of cortex granati, of catechu, &c. Purgative enemata, producing, as they do, more or less rapid depletion, may also be useful. The same may be said of the various plans which maintain stasis of blood for a certain time in the lower extremities; as the application of large cupping-glasses, and of ligatures to the limbs. These various agents, to which may be added the application of sinapisms to the lower limbs, or even of blisters (infinitely too highly spoken of by Mertens), secale cornutum in powder, &c., should be employed simultaneously. The hemoptysis is, in truth, such as to threaten the patient's existence, and, under such circumstances, it would be unjustifiable to wait to observe the influence of each of the plans mentioned in particular; time presses, some means of establishing complete perturbation of the system are called for, and consequently several of the methods should be simultaneously employed, though they might possibly attain the desired end if put in force separately. When the peril of the patient is extremely imminent, or were the hemoptysis, though not extremely copious, to continue in spite of the various plans mentioned, we should not hesitate to apply ice to the chest;—the practice is one more alarming than really perilous, and I have had recourse to it sometimes with success. It should scarcely be employed, however, unless the patient still possesses some share of strength.

It is a point generally understood, and does not require to be particularly dwelt upon, that the means now enumerated ought,

with the exception of the ice, to be continued for a certain time after the cessation of the hemoptysis. The patient should, for several days longer, observe complete silence; make no movement not absolutely requisite, and have the bowels kept open by simple enemata, so as to guard against every sort of unnecessary effort.

Hemoptysis has been known, after having persisted in spite of the most rational line of treatment, to yield suddenly to the use of an emetic. M. Rufz, in his excellent essay, already quoted, on Phthisis at Martinique, relates cases of the kind, the reality of which cannot be made matter of contestation. Ought we then, in similar cases, to have recourse to the same plan? The practice is one so strongly opposed to the common modes of treatment, and to the principle guiding us in most cases, that one necessarily feels hesitation in recommending the use of an agent which would seem better calculated to increase than remove the patient's peril. But the danger is extreme, and the treatment, called rational, has failed; why, then, should we not in so critical a conjuncture—when it is impossible to expect anything from the efforts of nature or art— why should we not have recourse to a system of treatment which has sometimes been successfully employed, and consequently carries with it some chance of safety?

If the *pains in the sides* which are so common in tuberculous persons, and are, generally speaking, the effect of dry pleurisy, were accompanied with *effusion* to a more or less considerable amount, and with febrile action at all marked, the antiphlogistic treatment should be put in force, and measured by the violence of the fever. The cause of the pleurisy must, however, not be forgotten, nor the state of feebleness of the individual in whom it occurs, nor the protracted course which it is almost inevitably destined to run,—otherwise we might throw the patient into a state of weakness beyond all hope of relief. An application of leeches to the painful place would be preferable to bleeding from the arm, were the pain very sharp and the febrile action moderate, and more especially if leeches did not produce much irritation. Under the existing circumstances, if irritation to a considerable amount were commonly produced by leeches in the individual under treatment, a minute dose of extract of opium, or some other sedative, should be administered before their application. With bleeding should be combined the exhibition

of diuretics, of which the powder and tincture of digitalis are perhaps to be preferred. The affected side should be covered with diachylum plaster, or with a plaster of hemlock and medicinal soap.

Were the pleurisy not followed by effusion, and attended with but slight febrile action, poultices or sinapisms to the painful part are all that is required; or recourse might be had to flying blisters. Leeches should only be employed, if the pain continued in spite of the means now pointed out, and they should be applied in very small numbers. And this because, on the one hand, daily experience shows, that the object we have in view may be attained with five or six leeches; and, on the other, because pains of the description under consideration, may frequently recur in various parts of the chest, and hence, did it become necessary to employ leeches frequently, the patient would be unnecessarily enfeebled by the employment of them in too large numbers.

Were pneumonia to supervene during the present period, antiphlogistic treatment should be had recourse to, and its extent made proportional to the severity of the symptoms. It is to be borne in mind, however, that pneumonia occurring during the first stage of tuberculous disease is generally less serious than that developed in healthy subjects, and, as well on this account as on account of the state of weakness, more or less marked, of the patients, requires less energetic treatment than under the latter circumstances. The other therapeutical agents should be the same as in ordinary cases, and tartarized antimony might be, and ought to be, employed in large doses, if bleeding had exercised but slight influence on the course of the disease, and if the weakness of the patient were such as to render the preservation of strength as far as possible deeply important.

Diarrhœa, which is so commonly observed during the second period of phthisis, supervenes pretty frequently during the first, sometimes even, as has been already mentioned, at the very outset, and in the majority of cases no doubt as an effect of intestinal ulceration. This species of diarrhœa, which depends upon the nature of and is an actual part of the principal malady, should be mainly combated by the means fitted to arrest the progress of the latter; but, as in the actual state of knowledge these means

are unknown, we are reduced, generally speaking, to the use of palliatives for the relief of this often formidable symptom. If then, the febrile action had not increased materially, at the outset of the diarrhœa, and the existing colic-pains were but slight, it would be justifiable to regard the symptom as more particularly the effect of the development of intestinal tubercles in greater or less number, or at least to consider inflammation of the mucous membrane of the intestine as having had but little part in its production. Under these circumstances, it would be enough to diminish the quantity of food and make some alteration in it; green vegetables of every kind should be totally abstained from, and generally speaking, every kind of food which leaves much residual matter after it. Rice-water, sugared and acidulated with lemon-juice, should be used as drink, or solution of syrup of quinces or white decoction, &c. A few drops of laudanum—six or ten to begin with, according to the susceptibility of the patient—should be administered in very small linseed enemata; and it would not be necessary to suspend altogether the gentle tonics mentioned at the beginning of this section. If, on the contrary, the violence of the febrile action and the severity of the pains suffered were such as to create apprehension of the existence of rather extensive inflammation of one or the other intestine, all nourishing food, together with the bitters and chalybeates, ought to be refrained from for a time. Diluent drinks should be prescribed, or such as have been just mentioned, with emollient or narcotic applications to the abdomen and opiates internally. Leeches should even be applied to the abdomen, and warm baths taken, if the other means employed were not followed by sufficiently rapid improvement.

The *perspirations* which supervene during this first period of the disease call, when profuse, quite as much as diarrhœa, for attentive management on the part of the practitioner. Like diarrhœa, they are a dependence upon the nature of the principal malady, and are for this reason very difficult to combat. The first measure to be taken is, to remove everything calculated to promote the development of the symptom. Thus, the patient's room should not be too warm; he should use such quantities of blankets, as will do no more than protect him from the cold; whatever he drinks should be of the temperature of the

room, and not tepid, unless—as is very rarely the fact—drinks at all cool occasion cough. The bitters and chalybeates are to be continued if there be no contra-indication, and if diarrhœa which so frequently coexists with perspiration, do not exist to prevent it. Next, astringents should be had recourse to; among which the crystallized acetate of lead, a few years past, enjoyed a reputation which has at the present day fallen very considerably. From three quarters of a grain to a grain and a half [5 to 10 centigrammes] should be at first prescribed at night in the form of pill; and the dose successively increased. If no benefit be obtained from doses of from four and a half to six grains, white agaric should be substituted in doses, double or treble as large, of the powder, or the cold infusion of bark, decoction of catechu, or light sulphuric lemonade. The usual diet may be continued if the state of the abdomen permit it.

Chronic peritonitis, whatever be its exciting causes, whether it be developed independently of sub-peritoneal tubercles, or along with these, is, even more intimately than the preceding symptoms, connected with the nature of the principal malady, inasmuch as it is proper to phthisical subjects: for this reason treatment is even more ineffectual in respect of it. As the pain accompanying it is, generally speaking, slight, local emollient and narcotic applications, with small enemata of the same kind, sedatives internally and diluents, will in common cases suffice for its treatment. Leeches should not be had recourse to, unless the pain were somewhat severe, and then be applied in small number, so as not to waste the patient's strength, should it become necessary to have repeated recourse to them. If there were no diarrhœa present the bowels should be kept open with simple enemata; for the adhesions, which are the inevitable result of chronic inflammation of the peritoneum, oppose the progress onwards of the contents of the bowels.

Tuberculous meningitis also occurs occasionally, as we have seen in an earlier part of this volume, during the present period. It threatens the existence of the patient who becomes its subject, and unfortunately here, too, therapeutic art must admit its powerlessness. We can only hope by means of the best-indicated measures to retard the fatal issue by diminishing the cerebral congestion. With this view, revulsion to the lower extremities should be put in force, slight laxatives administered,

cold applications directed to the forehead, and leeches placed behind the ears, their number varying with the violence of the febrile action and local symptoms, and the strength of the patient.

If the *digestive functions* be disordered without much accompanying fever, or the evidence of gastritis, or a bilious attack (embarras gastrique), and if the mucous membrane of the stomach do not appear obviously diseased (as we have seen to be the fact in several cases of latent phthisis), and provided further, bitter infusions or extracts are found insufficient to restore tone to the stomach, recourse may be had (without any apprehension of exciting cough) to mineral waters, the natural Vichy waters (from the Source des Célestins), the Bussang water, natural or artificial, Seltzer water, at meals or in their intervals, diluted or not with common water, or a small quantity of wine. I have prescribed Seltzer water to several hundred phthisical patients in hospital and private practice, without exciting cough, indeed without ill effect of any kind, and, on the contrary, with obvious benefit, in respect of regularity and facility of digestion. And when (after having received as the first answer to my question, whether patients had not coughed more from the time they had commenced to take the Seltzer water, that they certainly had not done so, and sometimes that they had actually coughed less), I feigned to doubt their correctness, they reiterated their first assertion with a firmness which placed its truth beyond question. I insist upon this point, because it is matter of received opinion among non-professional persons and medical men that acid or sourish drinks increase cough, whatever be its cause; whereas, the fact is, that such drinks are well borne, and that if they ever excite cough they do so with such rarity that I do not know of two instances of the kind. For this reason I do not hesitate to allow phthisical patients, who are tired of tasteless food, to use a little oil and vinegar as sauce; and I have never observed any ill effect from such indulgence.

As regards vomiting of matters not mixed with bile, which only supervene during fits of coughing, and which are not attended either with loss of appetite or epigastric pain,—a species of vomiting very frequent during the present period of the disease,—it can only be prevented by measures capable of quieting the cough, and it is unnecessary to delay longer with the subject.

SECOND PERIOD.

During the second period the symptoms of the first continue, and acquire additional severity; and additional anatomical alterations, generally of very serious character, supervene. If, as I have already hinted, we cannot hope, in the existing state of therapeutical art, to combat them successfully, we must at least endeavour to retard their progress by the means which I proceed to point out.

If the malady follow a very chronic course, the transition from the first to the second period is insensible; the aspect of the malady undergoes no obvious change, and the means employed during the first period suffice. The bitters, chalybeate medicine and mineral waters, the tonics and succulent diet, and open-air exercise, as already counselled, should be continued; the object should be, in a word, to support the strength by regimen and tonics. Under the contrary circumstances, if the disease, although advancing slowly, make an amount of progress that may readily be appreciated, the treatment must be modified.

Still, if under these circumstances even the febrile action be inconsiderable, if the thirst be not very distressing, and if there be no contra-indication in the state of the digestive organs, mild bitters and tonics are preferable to mucilaginous and simply diluent drinks; to these we should have recourse, if the former cannot be borne. The patient should still have an animal diet, if the state of the stomach permit it; and green vegetables should, on account of their slight nutritious properties, be as much as possible abstained from. But if the fever be high, the appetite gone, the thirst urgent, and decided repugnance to bitters exist, these medicines ought to be given up, and for a time at least exclusive recourse must be had to diluents.

If the *cough* be severe and troublesome, sedatives, such as those mentioned already—opiates, stramonium in pill or cigaret, fumigations made with an infusion of the latter or some allied plant—are indicated. If these means fail, large emollient poultices may be had recourse to, or sinapisms to the lateral regions of the chest or even flying blisters.

As respects the *sputa* and their degree of abundance, it must be remembered that during the present period they are derived from

two sources,—the breaking down of tubercles or the evacuation of cavities and the secretion of the bronchi. Until the evacuation of the cavities be completed, it does not clearly appear why expectoration furnished from this source should be interfered with. But the transit of tuberculous matter through the bronchi does not take place without the mucous membrane lining them becoming more or less violently inflamed. We should endeavour to diminish this inflammation, and with this view prescribe diluents, without if possible giving up the use of tonics in pill or mixture. Above all, it is advisable that the patient inhale two or three times daily the vapour of an infusion of hyoscyamus or belladonna. It is conceivable, in truth, that these vapours coming in contact with an inflamed mucous membrane should diminish the inflammation. But, on the other hand, it must not be forgotten that here the cause of the bronchial inflammation is permanent, that the evacuation of the tuberculous matter once effected, the fluids secreted by the cavities pour into the bronchi, and that these excretions keep up the inflammation to be combated; hence it is, that in many cases the palliative treatment in question is but little successful. In order then to attain our object, we should be acquainted with some means of modifying the secretion of tuberculous cavities, into which new tubercles are with the progress of softening commonly poured. No doubt a well-regulated regimen may have a beneficial influence on the secretion in question, and of this we have the daily proof in hospital practice; the sputa of patients received into hospitals at various periods of the disease are sure to undergo a complete change of appearance,—and become in a few days purely mucous, instead of pale, grayish, greenish opaque and deficient in air, as they were at the period of admission, and without any other means having been taken to produce the effect than simply putting them upon a better regulated system of diet. But this amendment is, generally speaking, short lived; the employment of the means just referred to soon becomes necessary, and these means themselves, if at first productive of benefit, soon become useless, at least in the great majority of cases. We might then try, with some prospect of success, chlorine inhalations,which proved successful in the hands of M. Toulmouche, of Rennes, in chronic pulmonary catarrh, or direct a little tar to be evaporated in the patient's room.

Sulphurous waters, and especially the Eaux Bonnes, which are so frequently employed with success in catarrhal affections, should also be tried under these circumstances,—provided the febrile action present be inconsiderable, otherwise they might be productive of very ill effects. If the patient's strength were not much diminished, and he could travel without inconvenience, he should be directed to drink the waters at their source, so as to derive the benefit as well as of a more or less complete change of habits as of the waters themselves. This change, I may observe incidentally, is a circumstance which will always render it a matter of difficulty to ascertain the real amount of utility of mineral waters taken at their source. The Eaux Bonnes might also be taken with some advantage during the first period of the disease, if the expectoration were abundant, and the febrile action inconsiderable.

The local means, which may be employed with some hope of success against violent inflammation of the bronchi, might also, to a certain extent, prevent the development of the *ulcerations* observed in those tubes, or at least retard their progress. The same may be said of the ulcerations of the trachea, which depend on the same cause, and so rarely give rise to symptoms distinctly traceable to them,—as also of those of the larynx and epiglottis. The latter, which cause such severe pain in swallowing, and are in many patients the constant seat of prodding and lancinating pain, unfortunately resist all treatment but too effectually. Leeches applied to the painful place scarcely afford any relief, and the same may be said of blisters and issues. Should we have more influence over the progress of these ulcerations, and their destructive action, by touching them with a sponge soaked in a solution, more or less concentrated, of nitrate of silver? I know not, but the plan deserves trial; for those commonly employed are almost always powerless, and opium itself scarcely quiets the pain for a few moments,—a pain which, in addition to its other distressing characters, has that of incessantly bringing on a desire to swallow.

Hemoptysis occurring during the present period should be combated by the same means as during the first. Care must be taken to bleed the patient (should it appear necessary to have recourse to bloodletting) in proportion to his strength.

Pneumonia should be treated immediately on its appearance;

but the kind of treatment should vary with the extent of the inflammation, the severity of the general symptoms, and, above all, the state of the patient's strength. Should the febrile action have been very violent at the outset of the pneumonia, one or two bleedings, more or less copious, should be prescribed without hesitation. If it were not considered advisable to repeat the bleeding, although the inflammation had not yielded, recourse ought to be had to tartarized antimony in large doses. The existence of diarrhœa need not prevent the exhibition of this medicine, if there were no contra-indication in the state of the stomach, nor any signs present of inflammation of its mucous membrane. It would be useless to continue the employment of this salt, if after two or three days' use at the most, marked benefit had not been obtained.

Pleurisy may, as has already been seen, supervene at all periods of the disease. If the patient were in a state of advanced debility, no blood should be taken from him at all, or a few leeches only applied to the seat of pain. The entire of the affected side should be covered with diachylum plaster, and diuretics (especially digitalis) given. The physician should bear in mind, what will prevent him from inflicting useless annoyance in the way of treatment upon the patient, that on the one hand recovery from simple pleurisy takes place, generally speaking, slowly, and on the other that the affection, as occurring during the second period, very rarely terminates in recovery. At an earlier period, if the patient's strength had not failed very materially, we might still hope for a favorable result, and treat the affection on the antiphlogistic plan, proportioned to the patient's strength.

The pain and sensation of suffocation which are the most troublesome symptoms of *perforation of the lung*, ought to be immediately treated with opiates and extract of stramonium, the latter in doses of about from a third to half a grain [2 to 3 centigrammes] ; mustard-poultices should be applied to the lower extremities, and a few leeches to the seat of pain, if the patient's strength permitted this. Some aromatic infusion, or simple solution of syrup of orange flowers, may be used as drink. When the signs of effusion supervene, it is advisable to apply a very large piece of diachylum plaster to the affected side. Should the pain, after having ceased, recur with any sharpness from time to time, and it were considered desirable

on account of its frequent return and severity, to combat it by any particular means, the practitioner must bear in mind that the cause of the pain cannot be completely removed, and that the patient has need of all his strength to bear up against the principal malady. Keeping these facts in view, he will apply but two or three leeches, or flying blisters to be dressed with an opiate ointment.

Symptoms of *pericarditis* occur more rarely at this period of the disease; the pulse then suddenly becomes irregular; and the patients, when interrogated carefully, state that they experience some pain at the precordial region, &c. According to the state of the strength, which must always be made subject of careful consideration, either a few leeches should be applied to the precordial region, or simply a plaster of medicinal soap or hemlock. The same facts are to be borne in mind too in respect of this affection as were pointed out in connexion with pleurisy,—namely, that effusion into the cavity of inflamed serous membranes is slowly absorbed, when it takes place in healthy persons, and rarely disappears in the closing stage of organic diseases.

The state of the *digestive functions* requires particular attention at this period of the disease, when all the functions are more or less seriously affected. Loss of appetite and sensation of weight at the epigastrium may be successfully combated by bitter or aromatic infusions and mineral waters, as those of Bussang, Seltzer, Vichy, &c. But when with these symptoms coexist nausea, vomiting. and more especially vomiting of bile,—when, in a word, inflammation of the mucous membrane of the stomach is either evidently present, or about in all probability to occur, the use of tonics should be given up completely, or at least suspended, and slightly acidulated diluents substituted for them, emollient poultices applied to the epigastrium, and a few drops of laudanum given in small enemata. Some success may be hoped from this mode of treatment, so long as the present period is not far advanced; but when there is much debility as well as repeated vomiting (I have related examples of the combination), the best advised treatment is commonly useless, and the disease goes on increasing in spite of everything that may be done to control it. It must not be forgotten, besides, that inflammation of the mucous membrane of the stomach, when limited to its

anterior surface, appears to depend upon the unnatural size of the liver, which is at the same time fatty, a morbid state upon which medical art has so far exercised itself in vain. A few leeches to the epigastrium might be of some benefit, at the outset of the inflammation under consideration, in subjects whose strength had not failed too far; but it is obvious that great discretion is called for in the employment of this mode of treatment, and I consider it needless to dwell longer on the matter.

The symptoms of ulcerations of the mucous membrane of the stomach are not distinguishable from those of its inflammation. And this is an additional motive, when the symptoms of the latter state exhibit themselves, for taking all care of the patient's strength; inasmuch as we have no means in the existing state of things of treating the ulcerations in question with any prospect of success.

Diarrhœa, which occasionally occurs during the first period of phthisis, is much more frequent during the present; few subjects, indeed, as we have already seen, are exempt from it. And if simple means suffice for its suppression in some instances, they do so only for a time; it soon reappears with greater severity and in greater abundance than before, and the most energetic means, the most appropriate too to all appearance (when the state of the mucous membrane of the stomach permits their employment), commonly fail in producing the desired effect.

Thus twenty-five of the patients whose cases have been analysed took white decoction with diascordium, and with or without opium, from twelve to forty-eight days before the fatal issue, with the following effects. These patients were divisible into three classes: in those of the first, ulcerations of small size were found in one or other intestine, or in both, coupled with, generally speaking, very advanced softening of the mucous membrane of the colon, which was often red and thickened. The ulcerations were of considerable size in the subjects of the second class, and the softening of the mucous membrane of the large intestine carried to about the same point as in those of the first class. Lastly, in the third class this membrane was somewhat softened, but free from ulceration and redness. In the subjects belonging to the first class (comprising altogether fifteen persons) diminution of the diarrhœa promptly followed the use of the diascordium, and continued till death. The softening in one

of these cases was inconsiderable in amount. In the second class, success of a similar kind was obtained in two of the eight cases composing it; in one of these the morbid changes were limited to a large ulceration in the cæcum. Lastly, in one of the two patients composing the third class, who had very copious diarrhœa before the administration of the diascordium, that symptom decreased extremely in amount from the period it was first taken, forty days before death. Hence, of twenty-five patients, six only appear to have derived any benefit from the use of this medicine; and indeed in three cases, in which the mucous membrane of the colon was more or less ulcerated, softened and thickened, increase of diarrhœa followed very closely on the exhibition of the remedy.

Decoction of catechu, in doses of two cupfuls daily, was also tried: sixteen of my patients took the medicine; five of them when in the very last stage of debility, four or five days only before death, and at a period consequently when the action of medicine is so difficult of appreciation, that we cannot fairly take them into consideration. Of the eleven others, who began to take the medicine two or three weeks before the fatal event, five appeared to benefit somewhat under its use. In one of these persons, however, the diminution, and subsequently the cessation of the diarrhœa were immediately followed by general uneasiness and distress, thirst, burning heat in the throat, &c.,—insomuch that this patient instead of rejoicing at the disappearance of his diarrhœa, complained of it. On post-mortem examination of his body, I discovered obvious traces of recent inflammation both of the mucous membrane of the stomach and trachea,—changes which in truth very often supervene spontaneously, and which, in the present instance, may have arisen quite independently of any action of the medicine; and further, a great number of intestinal ulcerations with softening of the mucous membrane of the colon. These latter anatomical conditions existed in the other cases. Rhatany was employed under the same circumstances in one patient, but without the least success. Lastly, opium alone, in daily doses of from three quarters of a grain to a grain and a half [5 to 10 centigrammes] was prescribed in five cases; but the diarrhœa diminished in one case only, consecutively to its employment.

Thus diascordium, catechu, and opium had, to all appearance,

the same effects on the diarrhœa of phthisical patients where the disease had reached an advanced stage; and judging from the difference in mode of action of catechu and opium, it seems fair to conclude that the improvement observed was rather apparently than really due to either of those medicines.

Shall we then stand by as simple spectators of the sufferings produced by this symptom,—one which may hasten very materially the patient's destruction? Assuredly not. But it behoves us to study the state of patients minutely, before we determine upon the use of any agent possessed of active properties, to suspend it the moment the supervention of any new symptom calls for such suspension, and resume its use when that sympton has disappeared. Thus, if there be considerable diarrhœa, and if there be no other coexisting evidence of inflammation of the mucous membrane of the stomach, trial should be made of astringents, among which monesia ought not to be forgotten; opium too should be employed, especially in the form of enema. But if, after a few days' trial of these means, colic-pains, change in the character of the stools, slight increase of fever or rigors, &c. &c., should occur to denote inflammation of the mucous membrane of the intestinal canal, the astringent medication should, at least for some time, be given up and demulcents substituted in its room,—emollient poultices applied to the abdomen, and small linseed enemata with laudanum given. It is matter of importance that these small enemata be preceded by a large one, for the purpose of emptying the bowels. The same precaution must be put in force too, when the intention is to employ astringents; for the matters contained in the bowel, possibly promoting the formation of the changes it is the object to set a limit to or to cure, should obviously be removed.

If symptoms of chronic peritonitis supervene, it is expedient to meet them by the means already pointed out in respect of the first period, due regard being had to the state of the patient's strength. The same may be said of meningitis occurring under the same circumstances.

The means to be employed against the perspirations of the first period, are applicable to those of the present also. Should rigors become extremely troublesome, from the regularity of their return and their severity, a few doses of disulphate of

quinine are indicated. The rigors may not unfrequently be removed in this manner, but the hot fit continues to recur; and generally speaking, the rigors also immediately after, or soon after the cessation of the quinine. In other cases (Case XXXII) the disulphate of quinine produces more discomfort at the pit of the stomach than it entails relief by the suppression of the rigors, and it becomes necessary to give up its use. On the whole then, this salt is of but little importance in the present point of view.

It follows from all we have said, that through the whole course of treatment it must be borne in mind that phthisis is not a purely local affection, and that its first origin—as, no doubt, also its progress—is promoted by the lymphatic temperament and hereditary taint. We must remember that if the local phenomena of the affection should be combated with all the perseverance warranted by the existing state of knowledge, so also should the sum of general conditions which promote the development of the malady. And, let me add once more, the nature of those general conditions should be henceforth the principal object of the inquiries and meditations of observers of all countries.

§ 2. *Acute Phthisis.*

The invasion of this form of the disease is often of formidable character, as we have already seen, and resembles that of an acute affection of dangerous nature. Attacks of rigors, followed by heat of skin, great dyspnœa, cough, general uneasiness and restlessness, take place, unaccompanied by expectoration or by any positive sign derivable from auscultation or percussion, distinctive of the seat or nature of the malady. However, if auscultation and percussion have, after a few days' continuance of the serious symptoms enumerated, supplied no conclusive information—if there be no signs of pneumonia or pleurisy, while on the other hand the symptoms are not reconcileable with the idea of typhoid fever in its commencing stage, the existence of phthisis becomes matter of probability. If bloodletting have not been had recourse to up to this time, it should be delayed no longer, in consideration of the violence of the

dyspnœa and febrile action and the great tendency of the pulmonary parenchyma to inflammation under the circumstances in question. (p. 375.) However, as we are by no means sure, by repeating venesection frequently, of preventing the pneumonia which is likely to occur in a good proportion of patients affected with acute phthisis, and as extreme debility might render its development more easy, and so hasten the fatal issue of the disease, we must not lavish bloodlettings, in the hope of attaining an end which is, as respects the possibility of attaining it, probably imaginary. After one or two bleedings, more or less copious, according to the strength of the individual and the severity of the symptoms, it will be well to stop, and promote the effects of the loss of blood, by the exhibition of gentle laxatives, counter-irritation to the lower extremities, and diluents. If the cough be very troublesome, recourse should be had to sedatives—as opium or stramonium—to the inspiration of moist vapours, of those of boiling milk and water, for example, or of an infusion of hyoscyamus, and belladonna, &c. It is to be remembered, besides, that certain cases of phthisis, commencing with considerable violence, and not treated with much energy at the outset, have stopped short in their course. In such cases patients have lived a considerable length of time, suffering simply now and then from slight colds. Here is obviously an additional motive for not oppressing patients with varieties of treatment, of which we, in truth, know not the real value.

If the affection continue to advance with violence, notwithstanding the enforcement of active antiphlogistic and, subsequently, sedative treatment, death cannot fail to be the rapid issue of the case, and a modified antiphlogistic treatment is the only one applicable. Under the contrary circumstances, if the symptoms of most serious character undergo prompt improvement, and the febrile action diminish in the same manner, the patient falls into the same category with those in whom the disease follows a more or less slow course, and the system to be pursued in his subsequent treatment becomes that which has already been described.

INDEX.

Acute Phthisis, cases of, 351; fatal in thirty-four days, 351; in twenty-nine days, 355; in twenty days, 359; proportional frequency of, 372; severity of symptoms of, when rapidly fatal, 372; symptoms of, when less rapid in course, 374; pain deserves attention in these cases, 374; secondary morbid changes the same as in chronic, 375; pneumonia more frequent, however, in acute than in chronic, 375; conditions accelerating the progress of the disease, 376.

Aorta, caliber of, less than natural, 53; often red in the interior without being inflamed, 54, 55.

Arachnoid, sometimes thickened, or lined with soft pseudo-membrane, 134.

Asses' milk, use of, not advisable in large towns, 545.

Auscultation, results of, during the first period, 439; in the natural state at the apices of the lungs, 440; may be very rapidly altered in these regions, 441.

Balance of the functions, many practitioners found their practice on the supposed, 181.

Bile, oftener thick and black coloured in phthisical subjects than in the victims of other chronic diseases, and when the liver is fatty than under other circumstances, 103.

Bladder, urinary, extremely rarely the seat of tuberculous ulcerations, 111.

Blisters, application of, useless as a measure of prophylaxis, 541.

Brain, pretty frequently injected, softened generally or partially, 135; sometimes contains hydatids, 135.

Bronchi, never exist in cavities, nor in masses of gray semi-transparent matter, 26; state of, in the neighbourhood of cavities with which they communicate, 27; tuberculous pseudo-membrane rare on surface of, 27; compression of by the bronchial glands, 28; frequently ulcerated, 43; mode of production of ulceration of, 44; diagnosis of dilatation of, 466.

Bronchial glands, more frequently tuberculized than any other class, 91; are not red, when thus affected, 92.

Catamenia, how affected in phthisis, 278.

Causes, exciting,—influence of pneumonia, pleurisy, and pulmonary catarrh, on the development of tubercles, if such exist at all, is extremely slight, 494; unusual and non-inflammatory excitement of the lungs of long duration, insufficient for the generation of tubercles, 504; febrile action of some violence and duration may have this result, 504.

Causes, predisposing, 477; age one of the principal, 477; sex also, 479; constitution, occupation, and clothing are doubtful as, 481, 489, 490; the lymphatic temperament is one of them, 482; hereditary influence also, 483; climate and temperature not demonstrated to be among them, 491.

Cavities, tuberculous, where formed, 8; sometimes traversed by bands, 9; when of large size, limited to the upper lobe, 10; various sizes of, 14; materials found in, 15; sometimes consist of fibrin, 15; fragment of pulmonary tissue contained in, 23; when single, and unattended with other tuberculous disease, how its tuberculous nature may be proved, 24; transformations of, 24; vascular system of, 30.

Cervical glands, tuberculized, 90; this condition not dependent on any particular state of the trachea, 90; rarely exercise pressure on the vessels of the neck, 91.
Circulation, adventitious, round tubercles and cavities, 30.
Climate, change of, influence of, in warding off phthisis, 542; in arresting its course when once developed, 547.
Cold, not an exciting cause of tubercles, 506.
Course of phthisis, 351; influence of sex on, 377; of age on, 378; of constitution on, 379; of pregnancy on, 279, 381; of acute diseases on, 383; of pneumonia on, 383.
Cough, characters of, 161; increased by decumbency on the side of the chief cavity, 161.

Diagnosis of phthisis may be uncertain during the first period, 435; importance of auscultation and percussion during this period, 437; absence of coryza at outset important for diagnosis, 436; percussion often natural during part of this period, 437; alteration of respiratory murmur often precedes that of percussion-sound, 439; crackling sound limited to the apex extremely important in, 442; may be sufficiently easy soon after the outset, though the disease not very rapid in course, 452; elements of may be very few, and yet not the less certain, 457; may be indirectly effected by state of distant organs, 458; may be impossible, 460; generally easy during the second period, 464; how effected between it and dilatation of the bronchi, 466.
Diarrhœa, frequency and outset of, 222; intestinal ulcerations small when diarrhœa limited to closing days of life, 223; of large size when it is protracted and continuous, 224; influence of large ulcerations near the anus on the frequency and nature of the stools, 226.
Dilatation of the bronchi, diagnosis of, 466.
Duodenum, ulcerations of, mucous membrane of, not frequent, and of small size, 67; are peculiar to phthisis among chronic diseases, 67; are not affected by the state of the liver, 67.
Dura mater, often exhibits slits giving passage to glands of Pacchioni, 133.
Duration of phthisis very variable, 159.
Dyspnœa, degree, outset, and seat of, 175; sometimes commences in infancy, 176.

Emaciation, outset of, 308; causes of, 308; importance of in respect of diagnosis in some cases, 308; affects all organs, 309.
Emphysema, sub-cutaneous, rare in chronic diseases, 127.
Epiglottis, ulcerations of, 41; their frequency, seat, and mode of production, 41; no tubercles or granulations found with, 42; symptoms of, 247; treatment of, 559.
Etiology of phthisis, 477.
Exhalation, the common cause of hemoptysis in phthisis, 175.
Exudation, albuminous, on the tongue, cheeks, &c. 221.

Fatty transformation of the liver, 98.
Fever, period of outset, and duration of, very variable, 179; these variations rarely explicable, 180; continued, influence of, on production of tubercles, 504.
Fistula in ano, rare in phthisical subjects, 89.
Functions of organs may be deeply disordered for a length of time, without structural change, 182.

Gall-bladder, walls of, sometimes thickened and ulcerated, 103; cause of ulcerations of, 104.
Gastric symptoms, summary of, 206.
Gaseous distension of abdomen may depend on contraction of small intestine opposite an ulceration, 460.
Genital functions, state of, in males, 278.
Glands, lymphatic, state of, 90.
Granulations, gray semi-transparent, conversion of into tubercles, 2; follow the same course as tubercles in their development, 2; position of, in the lungs, 3; time occupied by in reaching the size of a pea, 3; found in all organs, 32.

Hearing, functions of, impaired from destruction of the membrana tympani, 307.
Heart, rarely enlarged, often very small, 48; tubercles very rare in its substance, 50; fatty transformation of, in females only, as in other chronic diseases, 52.
Hemoptysis, frequency of, 166; amount of, 166; diagnostic importance, 167; more frequent in females than males, 170; differently influenced by age in the two sexes, 170; rare before the age of fifteen, 170; is sometimes extremely obstinate, 171; is almost always produced by exhalation, 175; not apparently an exciting cause of tubercles, 505; treatment of, 550, 559.

Inflammations of various organs very frequent at the close of phthisis, 151; and of other chronic diseases, 152.
Issues, inutility of, in the treatment of phthisis, 546.

Kidneys sometimes contain serous cysts, 107; rarely become fatty, 112; rarely tuberculous, 112; never so in other chronic diseases, 112.

Lactation, if fit for women of weak constitution, 543.
Large intestine, mucous membrane of, often red, softened, and thickened, 82, 83; oftener so in phthisis than in other chronic diseases, 89; causes of softening of, not always the same, 84; the inflammation causing their softening often takes place during the closing days of life, 85; tuberculous granulations of, 85; ulcerations of, in phthisis, 85; ulcerations of, in other chronic diseases, 89.
Larynx, ulcerations of, 41; never presents tuberculous granulations, 42; symptoms of ulcerations of, 260.
Latent phthisis, 408; proportional frequency of, 432; divisible into two classes, 432; diagnosis of, 433; cause of latency, 434.
Liver, often fatty, 98; characters of fatty, 98; this transformation most frequent in females, 99; causes of it, 99; may be rapidly effected, 99; not attended with proper symptoms, 100; sometimes emphysematous, 102; rarely tuberculous, 100; fatty transformation of, and tubercles of, mutually exclusive in the quadrumana, 102.
Lumbar glands, state of, 96.
Lungs, the left more favorable than the right to the development of tubercle, 6; invested at the apices by a semi-cartilaginous cap, 38.
Lymphatic glands, state of, 90.

Matter, gray semi-transparent, in masses, frequent in tuberculous lungs, 4; convertible into tuberculous matter, 4; found in other organs, 4.
Meningitis, tuberculous, symptoms, duration, and course of, 280-282; exciting cause of, 288; sometimes occurs in an early stage of phthisis, 300; sometimes difficult of diagnosis, 301.
Menstruation, state of, 278; continues sometimes to the very close, 278; when most commonly suppressed, 279.
Mesenteric glands, often tuberculous, 93; those nearest the cæcum most frequently affected, 93; gray semi-transparent matter rare in the, 94; cause of tubercles of, 94; tubercles of, as frequent in acute as in chronic phthisis, 96.
Meso-cæcal glands, state of, 96.
Meso-colic glands, state of, 96.
Morbid state proper to phthisis, 152; common to this and other chronic diseases, 152.

Œsophagus, rarely ulcerated, 56; softened and attenuated internally in some subjects, 56.
Omentum, transformed into gray semi-transparent matter, mixed with tubercles, 129.
Ovaries, sometimes tuberculous, 119.

Pain, thoracic, degree, frequency, seat, extent, and duration of, 176; generally proportional in severity to the extent of pleuritical adhesions, 178; sometimes neuralgic, 178.
Patches of Peyer, natural characters of, 68.
Percussion often natural under the clavicles during part of the first period, 437; difference of, under clavicles, may depend on old pleurisy, or emphysema, 438; results of, may long continue uncertain, 439.
Perforation of the lung and pleura, 309; rational symptoms, 328; physical signs of, 329; time elapsing between its occurrence and death, 333; how to be explained, 334; period of phthisis at which it occurs, 334; most common seat of, 343; left side more frequently affected than right, 343; sometimes several perforations, 344; shape of, not always rounded, 344.
Pericardium, rarely adherent, or covered with recent pseudo-membrane in phthisis, 51; gray granulations of, 51, 52.
Peritoneum, very frequently seat of serous effusion, 122; sometimes acutely inflamed, 122; more frequently the seat of chronic inflammation, with or without miliary granulations, 122, 123; these granulations may form rapidly, 129; pseudo-membranes of, sometimes tuberculous, 129; causes of chronic inflammation of, 130.
Peritonitis, symptoms of, generally speaking, few in number, and not strongly marked, 226; their course, 226; differential diagnosis of tuberculous and cancerous, 228; summary of symptoms of tuberculous variety, 246.

Perspiration, characters of, 181; amount of it is not inversely as that of diarrhœa, 181.
Pharynx, ulcerations of, rare, 56.
Phthisis, pathological anatomy of, 1; semeiology of, 155; duration of, 159; course of, 351; acute form of, 351; latent form of, 408; diagnosis of, 435; prognosis and termination of, 472; etiology of, 477; treatment of, 509.
Pia mater, frequently infiltrated with serosity, sometimes injected, 135; pretty frequently contains gray granulations, 146.
Pleuræ, adhesions of, more frequent in phthisis than in other chronic diseases, 35; may become the seat of gray semi-transparent granulations, 36; may become inflamed at close of life, 37; serous effusion in, 37.
Pleurisy, occurs at various periods, 276; rarely ends in recovery, 276; importance of, when double, in respect of prognosis, 277.
Pneumonia, occurs at various periods, 274; its symptoms vary according to the period of its occurrence, 274; not a serious affection, when the primary disease unadvanced, 275; more frequent in acute than chronic phthisis, 375; treatment of, 565.
Pregnancy, influence of, on the progress of phthisis, 279, 381.
Prophylaxis of phthisis, 539.
Pulmonary artery, its mode of distribution in tuberculized lungs, 29, 417.
Pulmonary veins, obstructed by pressure of tuberculous matter developed in the walls of the left auricle, 50.

Rigors, sometimes absent from first to last, 180; hour of daily occurrence of, 180; effects of bark on, 180.

Serous membranes, more or less frequently the seat of effusion in phthisis, 151.
Sexual passion, not particularly active in phthisical subjects, 278.
Small intestine, mucous membrane of, natural characters of, 68; glandular patches of, 68; softening of, with or without redness, 71; granulations of, two varieties of, 72, 73; ulcerations of, 74; are proper to phthisis, 82; causes of, 88.
Spleen, sometimes tuberculous, 105; more rarely contains gray semi-transparent granulations, 106; size of, 106; consistence of, 106; anatomical changes of, in subjects cut off by other chronic diseases, 106.
Sputa, their characters and differences in the two periods of phthisis, 162; quantity of, very variable, 163; sometimes taken for matter of pleuritic effusion evacuated through the bronchi, 164; derived from two sources, 165.
Stomach, size and position frequently changed in phthisis, 57; mucous membrane of, often softened and attenuated, as also sometimes the sub-mucous tissue, 58; nature of this softening, 60; inflammation of anterior surface of, connected with fatty state of the liver, 60; symptoms of, 191; mammillation of mucous membrane of, exists where stomach large as well as contracted, and is very rarely the only alteration present, 75; symptoms of this state generally obscure, 205; ulcerations of, less frequent than mammillation, 63; they are sometimes attended with severe symptoms, 205; mucous membrane of, seldomer healthy in phthisis, than in other chronic diseases, 66; mucous membrane, seat of cicatrices in, 212; muscular coat of, partially transformed into fibrous and semi-cartilaginous tissue, 216.
Stricture of small intestine opposite an ulceration, 81, 460.
Sudamina of rather rare occurrence, and never numerous in phthisis, 181.
Sudden death in phthisis, 389; sometimes explicable by state of organs, 389; sometimes not so explicable, 395; connected with softening of entire brain, 401.
Supra-renal capsules, sometimes tuberculous, 107.
Sweats [*see* Perspiration].

Termination of phthisis almost always by death, 472; instances where the disease was stayed in its progress, 472.
Thirst, very variable, and not dependent on the state of any particular organ 182.
Tinkling, metallic, is not pathognomonic of perforation, as it exists in large cavities, 330; its mode of production, 331.
Tongue, state of, in the various states of the gastric mucous membrane, 216; no necessary relation between its condition and that of the mucous membrane of the stomach, 220; sometimes covered with albuminous exudation, 221.
Trachea, characters of ulcerations of, 39; never contain granulations or tubercles, 44; ulceration of, proper to phthisis among chronic diseases, 46; symptoms

of ulcerations of, 262; symptoms of inflammation of, 273.
Treatment of phthisis, 509; alleged curative agents, 509; ioduret of iron, 509; statements of M. Dupasquier on the, 510; author's experience relative to, 511; chloride of sodium, 512; author's experience of, 514; sub-carbonate of potass, 515; sal ammoniac, 515; chloride of lime, 516; chlorine gas, 517; M. Cottereau's cases examined, 517; digitalis, 533; hydrocyanic acid, 535; creosote, 536; iodine, 537.
Treatment, prophylactic, especially applicable to lymphatic children, and those born of phthisical parents, 539; in what it consists,; influence of removal to warm climates in the, 542; in the working classes, 543.
Treatment, palliative, 544; of the first period of the chronic form, 544; not to be accomplished by local means, 545; asses' milk not to be recommended in, 545; use of bitters in, 546; inutility of issues in, 546; removal to warm climate in winter, effects of in, 547; influence of sea-voyages in, not really determined, 549; of hemoptysis, 550; of pains in the sides, 552; of pneumonia, 553; of diarrhœa, 553; of perspiration, 554; of chronic peritonitis, 555; of tuberculous meningitis, 555; of morbid states of the digestive functions, 556.
Treatment of the second period, 557; of cough during, 557; of expectoration during, 557; of ulcerations of the air-tubes, 559; of hemoptysis, 559; of pneumonia, 559; of pleurisy, 560; of perforation of the lung, 560; of pericarditis, 561; of derangement of the digestive functions, 561; of diarrhœa, 562; influence of diascordium, opium, and catechu on this symptom, 562; of chronic peritonitis, 564; of perspiration, 564; of rigors, 564.
Treatment of acute phthisis, 565.
Tubercles, characters of, 2; rarely exist in only one lung, 6; soften after a variable time, 7; encysted, very rare, 7; are not formed of concrete pus, 32; are not found in the trachea, larynx, or epiglottis, 44.

Ulcerations of the air-passages, less frequent in females than males, 42; they are proper to phthisis, among chronic diseases, 45; as also those of the pharynx and œsophagus, 57; of the small intestine, 74; similar in many points, no matter where existing, 152.
Ureter, tuberculized, 108.
Urethra, very rarely tuberculous, 118.
Uterus, generally diminished in size, 118; internal wall of, sometimes tuberculous, 119.

Vagina, ulcerations of, rare, 118; when they exist, 120; their probable mode of formation the same as those of the air-passages, 120.
Vasa deferentia, sometimes tuberculous, 113.
Ventricle, fifth, sometimes distended with serosity, 134.
Ventricles, lateral, often contain transparent serosity, 134.
Vesiculæ seminales, sometimes tuberculous, 113.
Vessels, adventitious, round cavities, and tubercles, 29.

THE END.

WELLCOME LIBRARY

PRINTED BY C. AND J. ADLARD,
BARTHOLOMEW CLOSE.

BOUND BY
WESTLEYS &